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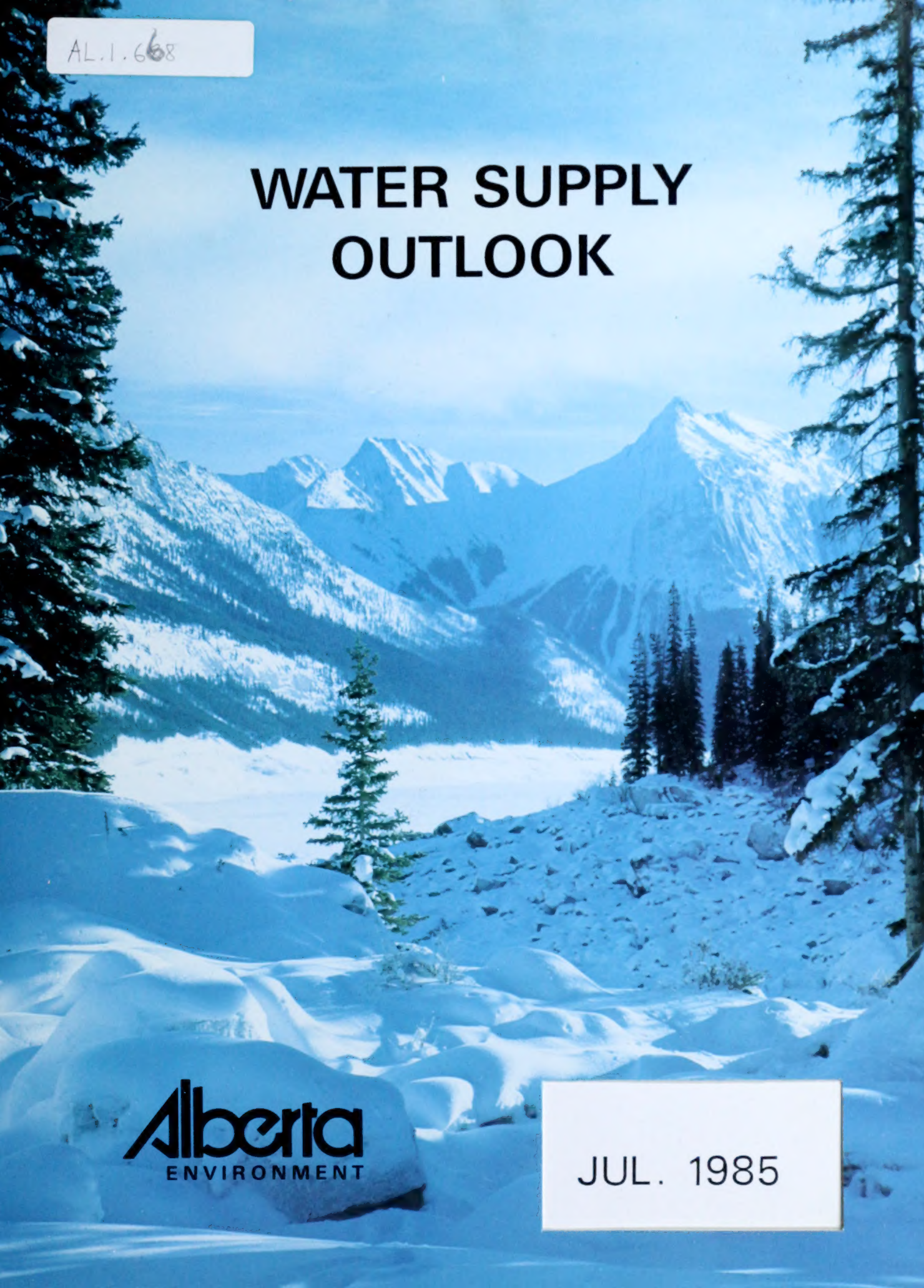
WATER SUPPLY OUTLOOK



Alberta
ENVIRONMENT

JUL. 1985

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WATER SUPPLY OUTLOOK

Alberta
ENVIRONMENT

Water Resources

Prepared by:
RIVER FORECAST CENTRE
and
SURVEY BRANCH
TECHNICAL SERVICES DIVISION
WATER RESOURCES MANAGEMENT SERVICES

JUL. 1985

COVER PHOTO
ALBERTA GOVERNMENT PHOTO

NOTES

The Water Supply Outlook update bulletin is published in July and August each year.

The River Forecast Centre and the Survey Branch of Alberta Environment acknowledge the assistance of Environment Canada (Water Survey of Canada and the Atmospheric Environment Service) in providing precipitation and streamflow data for this report.

The streamflow hydrographs and the natural flow data presented in this report are based on tentative hydrometric records which are subject to revision.

The real-time precipitation gauge data presented in Appendix A are also preliminary data which are subject to revision.

Units of Measure

Parameter	Units of Measure (metric)	Conversion to Imperial Units
Elevation	metres	1 m = 3.28 feet
Streamflow	cubic metres per second	1 m^3/s = 35.3 cfs
Volume	cubic metres	1 X 10^6 m^3 = 811 acre-feet

WATER SUPPLY OUTLOOK BULLETIN

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WATER SUPPLY OUTLOOK

JULY 1985

Summary

June was an extremely dry month for most of Alberta. For some southern areas of the province, the past month was the driest June on record. Precipitation during the month of June is an important element of the seasonal water supply for the major rivers of southern and central Alberta. The seasonal forecasts of water supply have therefore been reduced, dramatically in a number of cases. Natural water supply is now expected to be much below average in the Milk, upper Oldman, Highwood, Elbow and Red Deer River Basins, and below average in the rest of the Oldman and Bow Basins, and in the North Saskatchewan River Basin.

Weather Conditions

June was slightly cooler than normal throughout Alberta but much drier than normal in most areas. Parts of central Alberta in the vicinity of Whitecourt and Edmonton experienced very heavy rainfall on June 23 which resulted in some minor flooding. Otherwise, the month was notable for the lack of rainfall in southern and northern areas. The rainfall recorded at Lethbridge in June set an all-time low for the month: 3.2 mm. or 4 percent of the long-term average.

The precipitation for the principal weather stations in Alberta for the month of June expressed as a percent of average is presented in Figure 1. Precipitation for a number of key climate stations in southern Alberta for June is shown in Figure 2. Maps of summer precipitation from May 1, 1985 to June 30, 1985 are given as Figure 3 and 4. Graphs of precipitation accumulation since May 1, 1985 for a number of key climate stations in southeastern Alberta are presented in Figure 5.

Streamflow Conditions in Southern and Central Alberta

Rivers were generally high at the beginning of June from the melting of the mountain snowpack. With the lack of rainfall throughout the month, rivers receded gradually from their snowmelt peaks. Streamflow conditions were generally below average by the end of the month.

Natural streamflow volumes in June were much below average for the Milk, upper Oldman, Highwood, Elbow and Red Deer Rivers, and below average in most other rivers of southern and central Alberta.

Hydrographs for a number of river locations are presented in the individual river basin sections which follow this summary.

The flow of the South Saskatchewan River into Saskatchewan remained below average for the entire month of June. The hydrograph for the South Saskatchewan River below the Red Deer River confluence (at the Saskatchewan border) is presented as Figure 6.

Water Supply Volume Forecasts for Southern and Central Alberta

The seasonal volume forecasts for the principal locations as of July 1 are as follows:

STATION	FORECAST 1985 % of average	ACTUAL 1984 % of average
Milk River at Milk River	38	7
Oldman River near Lethbridge	58	49
Bow River at Calgary	77	67
Red Deer River at Red Deer	50	42
North Saskatchewan River at Edmonton	75	67

The volume forecasts are based on snow survey and climate data, and present natural flow trends. Rainfall in July and August normally has only a minor effect on water supply in the Milk, Oldman and Bow River Basins, but is still an important element for water supply conditions in the Red Deer and North Saskatchewan Basins.

The volume forecasts will be updated again in early August. A more detailed account of the water supply volume forecasts as of July 1 is presented in Table 1 and the individual river basin sections which follow.

Water Storage Situation

Storage levels were close to average at the beginning of July for most of the major irrigation reservoirs. Only Chin Reservoir was below average as of July 1. The demand for water for irrigation was high in June because of the lack of rainfall.

The hydroelectric power reservoirs in the Bow and North Saskatchewan River Basins were generally at normal levels as of July 1 except for Lake Minnewanka and Lower Kananaskis Lake which were below normal.

A detailed account of the water storage situation as of July 1 is presented in Table 2.

Monthly Precipitation Data

Alberta Environment now operates a network of 37 automatic climate station in the headwaters of the South Saskatchewan River Basin to provide data for flood and water supply forecasting. Monthly precipitation totals since November 1984 for these stations are provided in Appendix A. An index of the station locations is also provided.

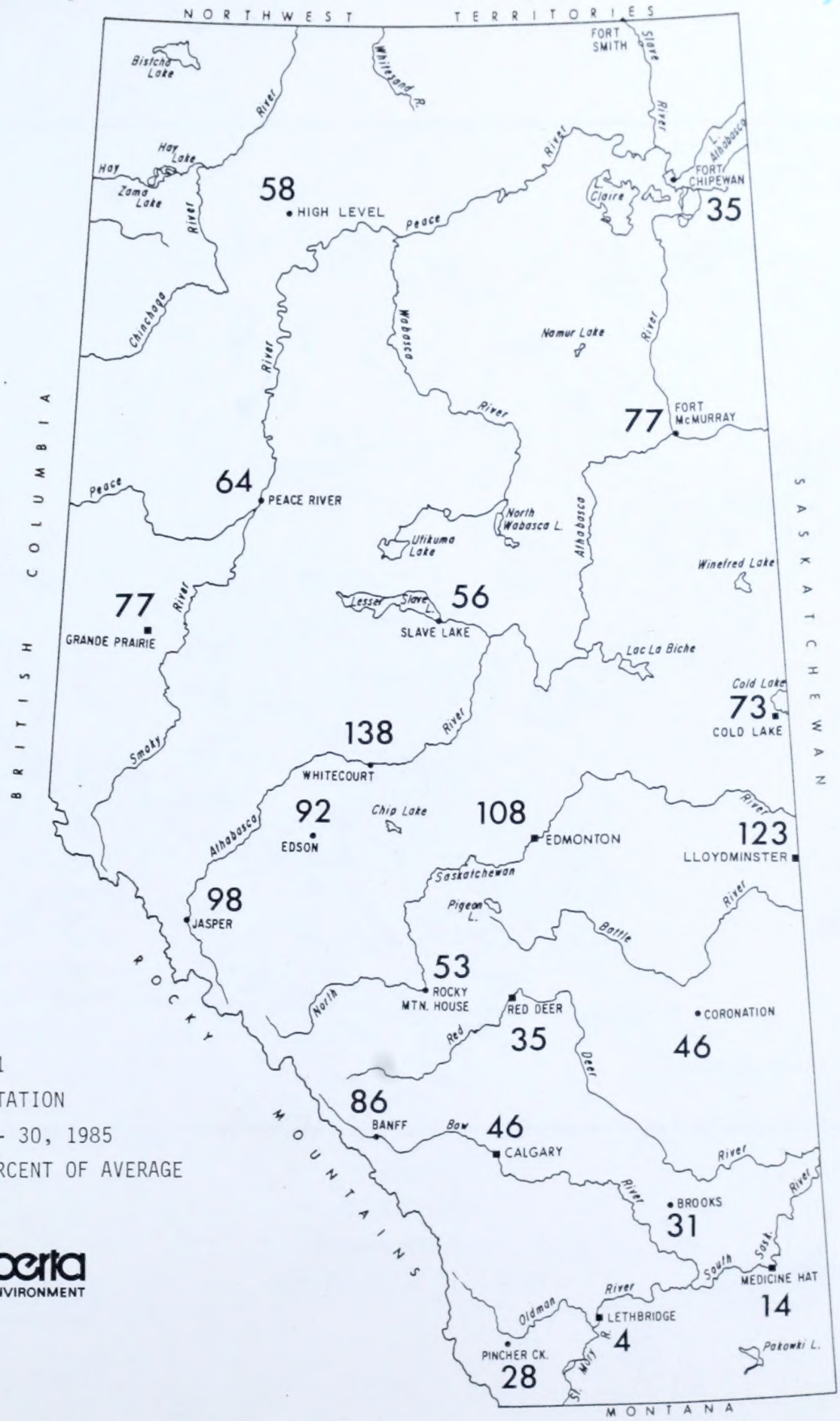


FIGURE 1
PRECIPITATION
JUNE 1 - 30, 1985
AS A PERCENT OF AVERAGE

Alberta
ENVIRONMENT

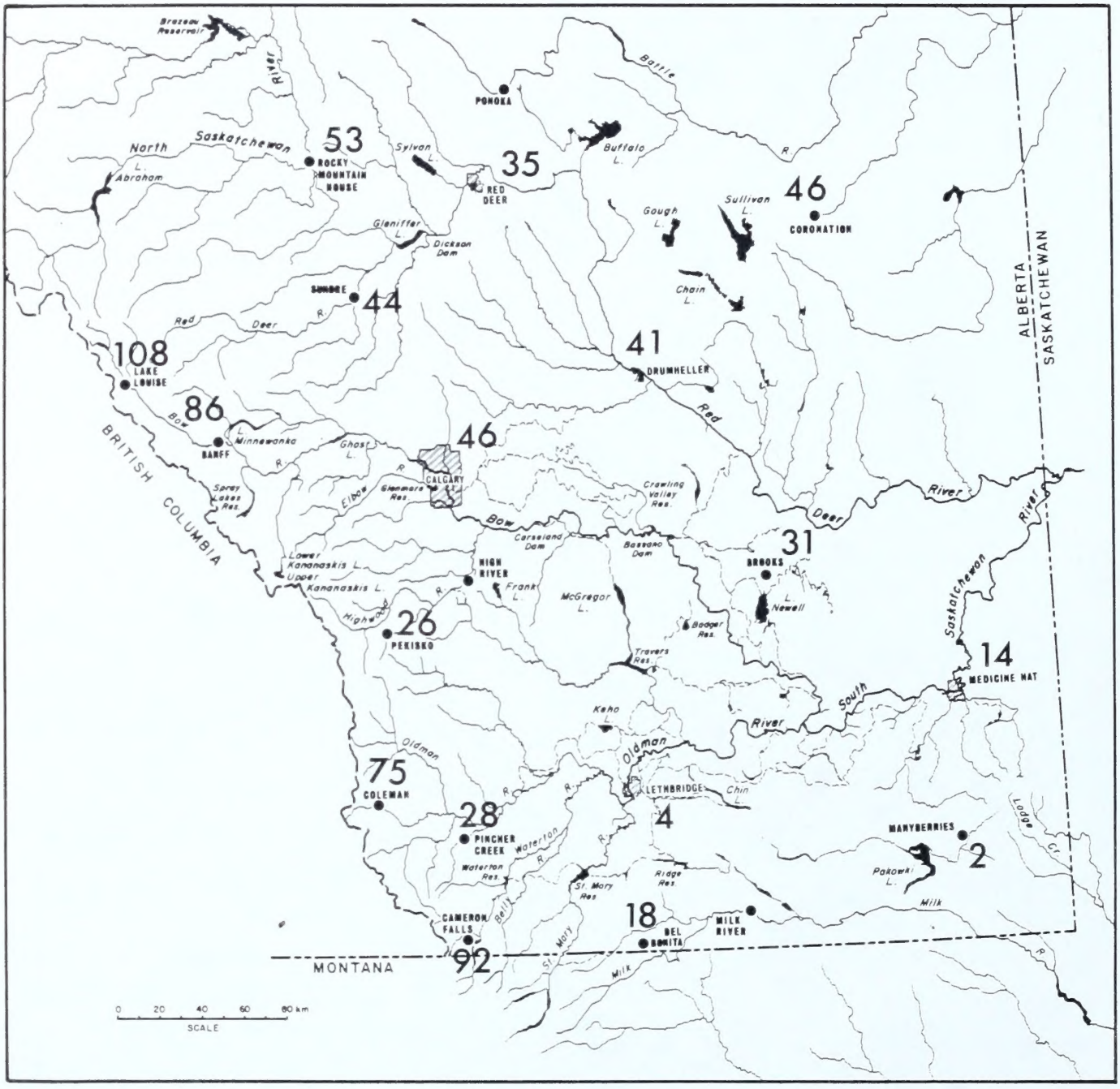


FIGURE 2
PRECIPITATION
SOUTHERN ALBERTA
AS A PERCENT OF AVERAGE

Alberta
ENVIRONMENT

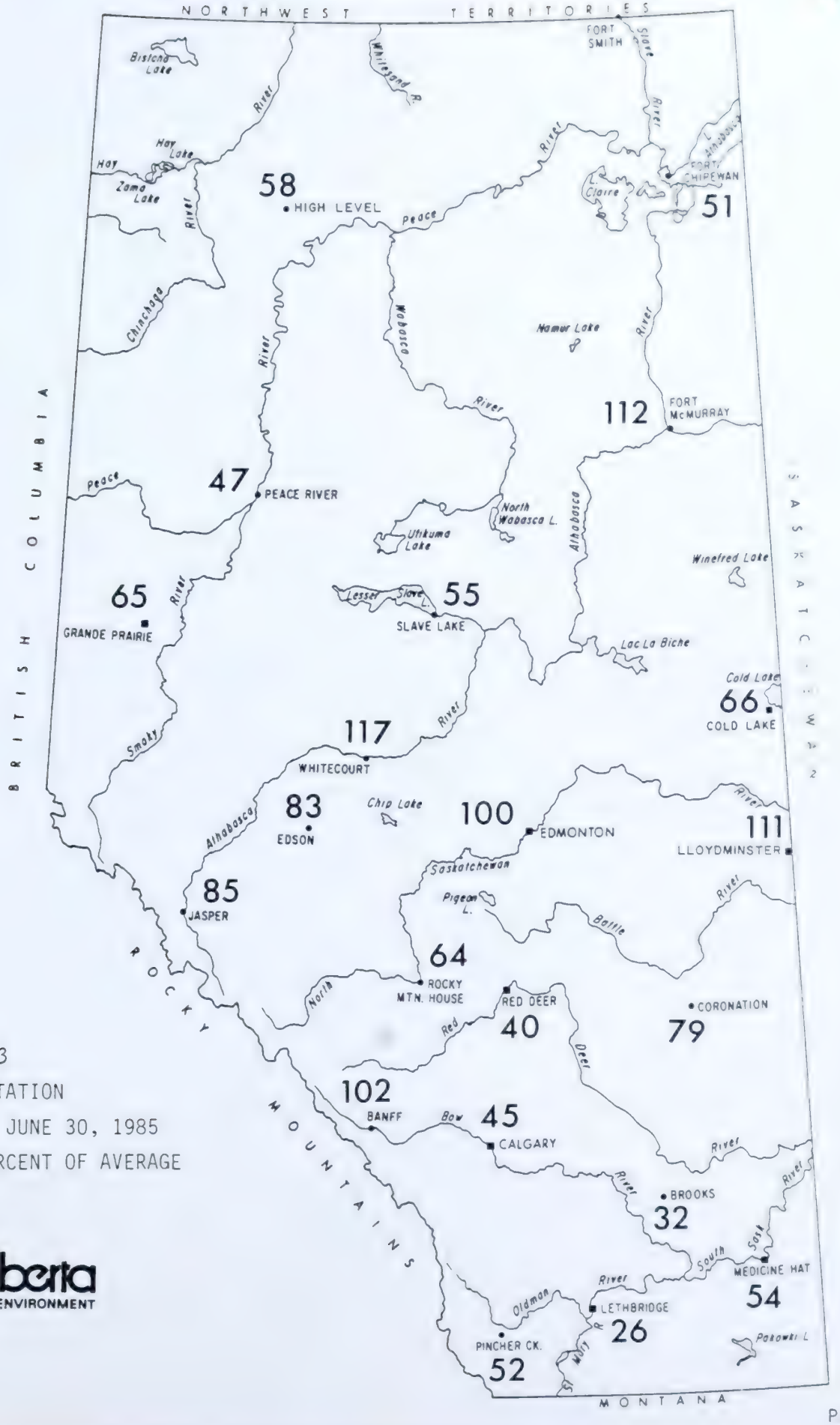


FIGURE 3
PRECIPITATION
MAY 1 - JUNE 30, 1985
AS A PERCENT OF AVERAGE

Alberta
ENVIRONMENT

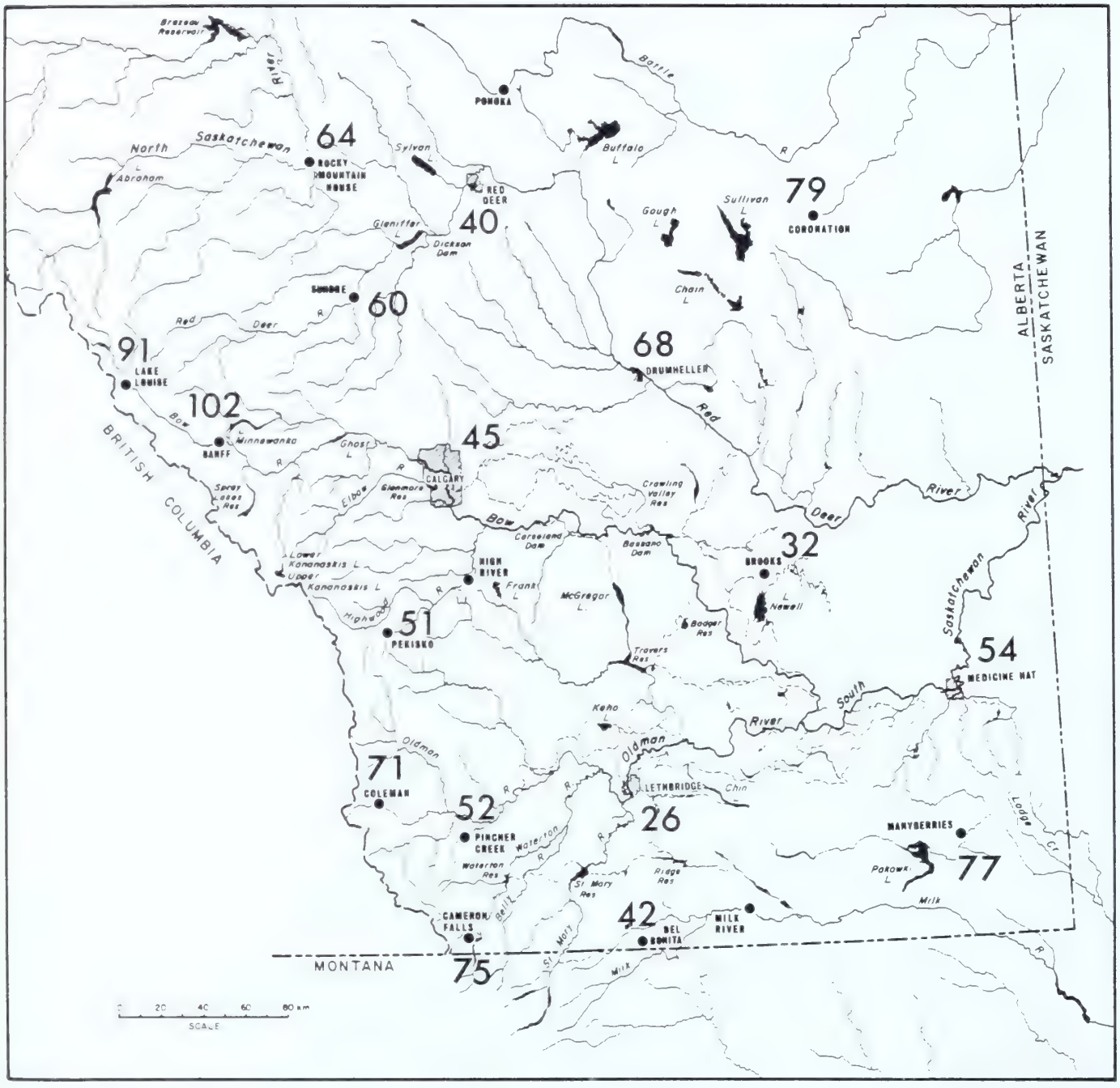


FIGURE 4

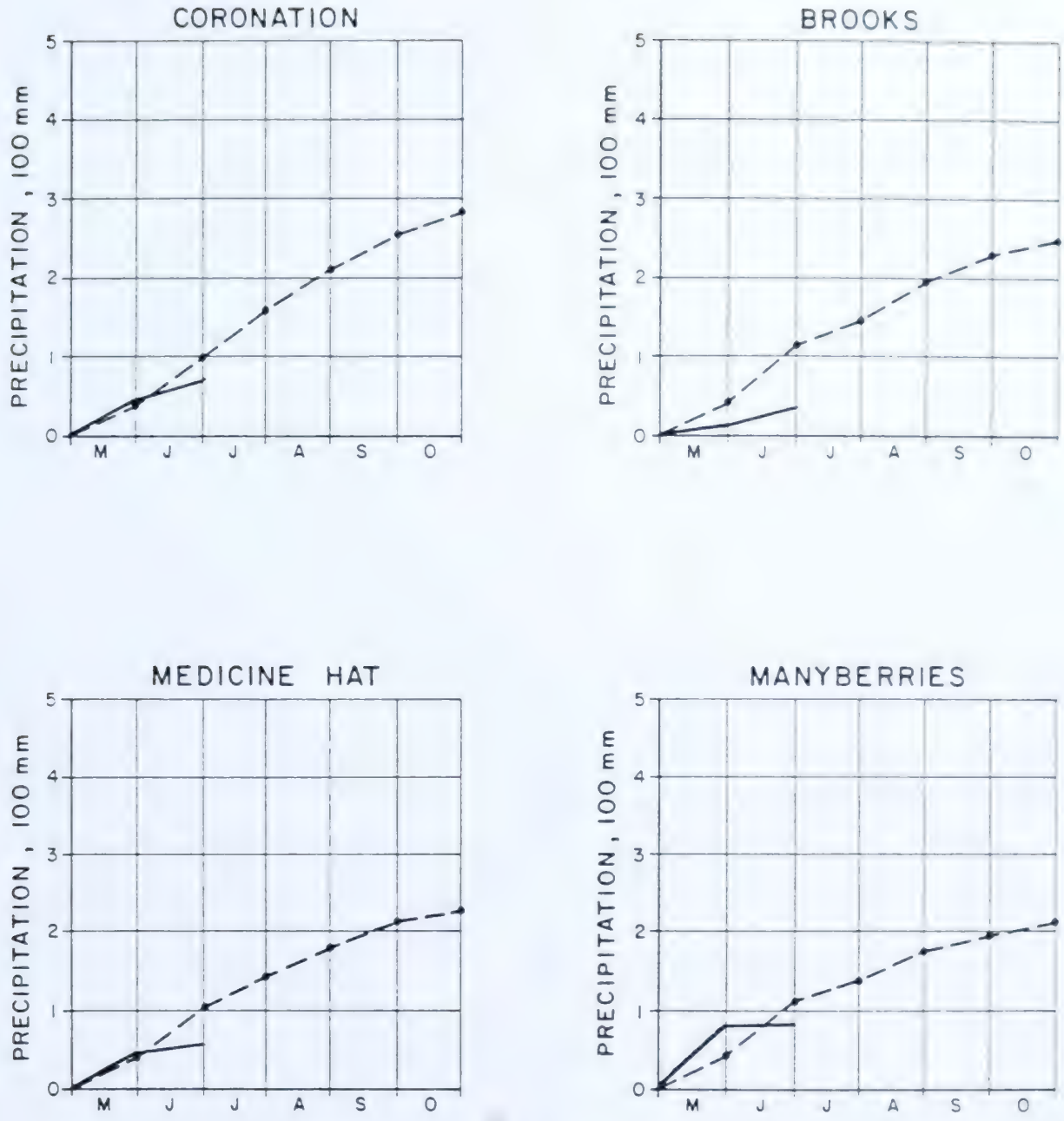
PRECIPITATION

SOUTHERN ALBERTA

MAY 1 - JUNE 30, 1985

AS A PERCENT OF AVERAGE

Alberta ENVIRONMENT



Alberta ENVIRONMENT

RIVER FORECAST CENTRE

WATER SUPPLY BULLETIN

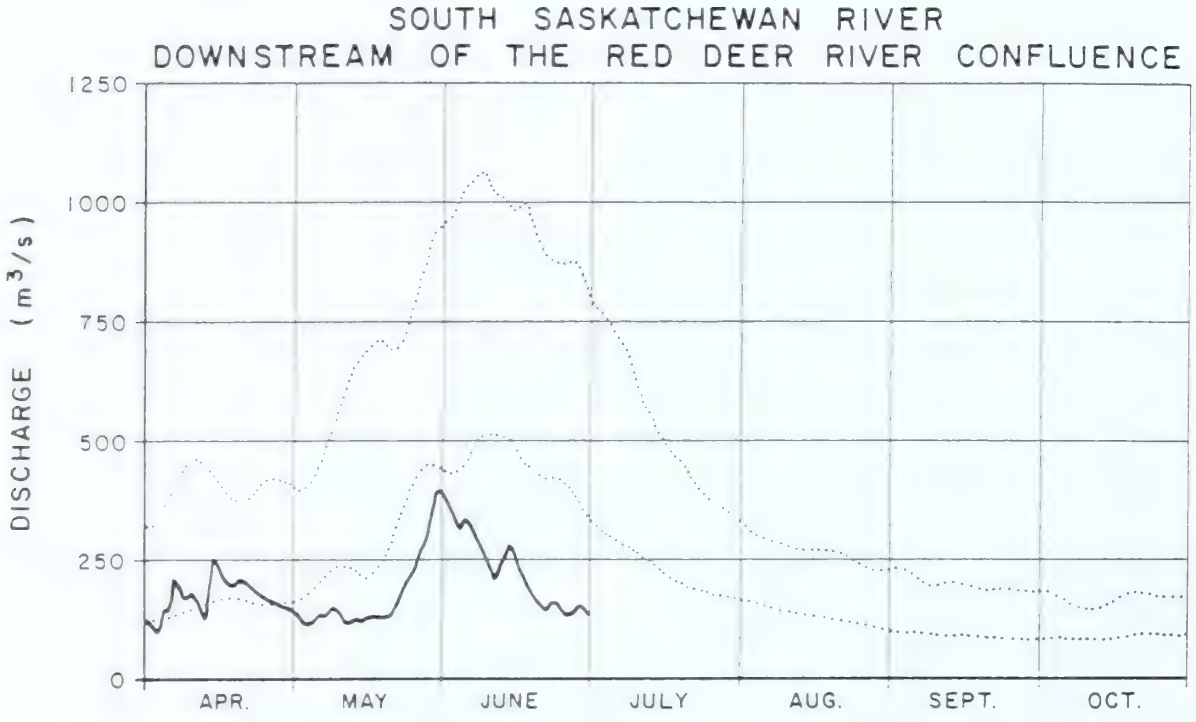
SUMMER PRECIPITATION
SOUTHEASTERN ALBERTA

SUBMITTED
DATE
APPROVED
DATE

DESIGNED
DRAWN B Sanders
CHECKED

SCALE AS SHOWN
DATE DEC , 1984

FIGURE 5



NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPH SOUTH SASKATCHEWAN RIVER
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE JAN , 1985

FIGURE 6

WATER SUPPLY OUTLOOK BULLETIN

TABLE 1

WATER SUPPLY OUTLOOK AS OF JULY 1, 1985
(Natural Flow)

	Volume Forecast for entire season		Volume Forecast for remainder of season	
	$10^6 m^3$	% of Avg.	$10^6 m^3$	% of Avg.
MILK RIVER BASIN				
Milk River at Milk River (Apr-Sept)	36	38	6	40
OLDMAN RIVER BASIN (April to September)				
St. Mary River near Int'l Boundary	590	81	180	72
Belly River near Mountain View	200	78	60	64
Waterton River at Waterton Park	410	78	100	68
Oldman River near Fort McLeod	640	52	150	52
Oldman River near Lethbridge	1,900	58	520	55
BOW RIVER BASIN (May to September)				
Bow River at Banff	880	83	510	87
Bow River at Calgary	1,700	77	930	83
Elbow River	120	59	70	73
Highwood River	320	52	170	74
Lake Minnewanka Inflow	130	62	70	70
Spray Lake Inflow	250	79	120	74
Barrier Lake Inflow (Kananaskis R.)	290	72	150	72
RED DEER RIVER BASIN (May to September)				
Gleniffer Lake Inflow (Dickson Dam)	440	55	260	60
Red Deer River at Red Deer	530	50	320	60
NORTH SASKATCHEWAN RIVER BASIN (April to September)				
Lake Abraham Inflow (Bighorn Dam)	2,000	89	1,300	90
Brazeau Reservoir Inflow	1,000	71	600	82
North Saskatchewan River at Edmonton	4,400	75	2,500	80

NOTE: Volume forecasts are based on spring snow surveys, winter and spring precipitation data, and the assumption of average summer precipitation.

Forecasts indicate natural runoff expected: adjustments have not been made for the effects of streamflow diversion and reservoir storage.

1 X $10^6 m^3$ = 811 acre-feet = 409 cfs-days

TABLE 2

MAJOR WATER STORAGE RESERVOIRS IN ALBERTA

Status as of JULY 1, 1985

	LIVE STORAGE (10^6m^3)	PERCENT OF MAXIMUM LIVE STORAGE	REMARKS	LIVE STORAGE July 1, 1984 (10^6m^3)
OLDMAN RIVER BASIN				
Keho Lake	25	53	Normal	13
Waterton Reservoir	93	81	Normal	103
St. Mary Reservoir	343	93	Normal	349
Ridge Reservoir	107	83	Normal	106
Chin Reservoir	131	62	Below Normal	145
TOTAL	674	82	Normal	703
BOW RIVER BASIN				
Lake Minnewanka	111	50	Below Normal	138
Spray Lake	150	57	Normal	139
Upper Kananaskis Lake	65	52	Normal	53
Lower Kananaskis Lake	30	48	Below Normal	26
TOTAL	356	53	Normal	356
Lake McGregor	251	78	Normal	258
Travers Reservoir	88	84	Normal	112
TOTAL	339	79	Normal	370
Lake Newell	101	57	Normal	115
Crawling Valley Reservoir	7	6	Filling	0
TOTAL	108	37		115
RED DEER RIVER BASIN				
Gleniffer Lake	179	88	Normal	165
NORTH SASKATCHEWAN RIVER BASIN				
Lake Abraham	262	19	Normal	501
Brazeau Reservoir	131	27	Normal	294
TOTAL	393	21	Normal	795

NOTE: 1 x 10^6m^3 = 811 ac-ft = 409 cfs-days

MILK RIVER BASIN

Weather Conditions

Precipitation for the month of June was much below average in the Basin. In the June edition of the Water Supply Bulletin, the precipitation total for the Del Bonita climate station for the month of May was erroneously reported as above average at 97 millimetres. The correct amount for May was 47 millimetres which was 80 percent of average. A graph of precipitation accumulation since May 1, 1985 for the climate station at Del Bonita is presented as Figure 7.

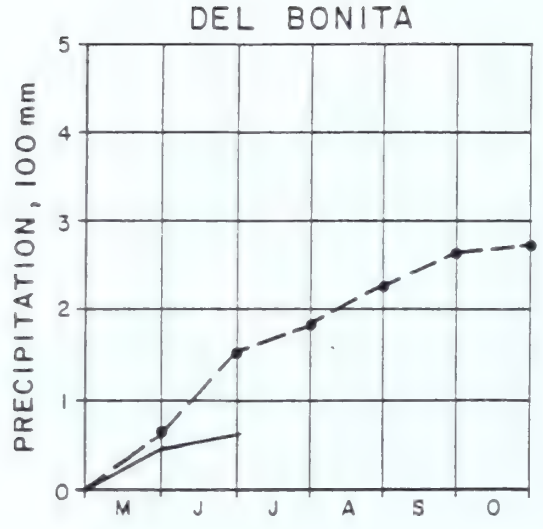
Streamflow Conditions

River levels were quite constant throughout June at the Town of Milk River. Most of the flow in the river during the month came from the diversion from the St. Mary River in Montana. The natural flow was only 40 percent of average in June, and has been only 25 percent of average since April 1. The hydrograph for the Milk River at Milk River is presented as Figure 8.

Water Supply Volume Forecast

The expected volume of natural streamflow for the April-September period has been lowered to 38 percent of average as a result of lack of rainfall in June. The forecast for the July-September period calls for only 40 percent of the average natural flow for the period. The seasonal water supply in 1984 was only 7 percent of average. A detailed presentation of the volume forecast is given in Table 1.

This year, most of the water in the Milk River during the summer will originate from the St. Mary River. It is still expected that the level of the Milk River will remain within the normal range for most of the rest of the summer although it may drop below normal in late August.



LEGEND

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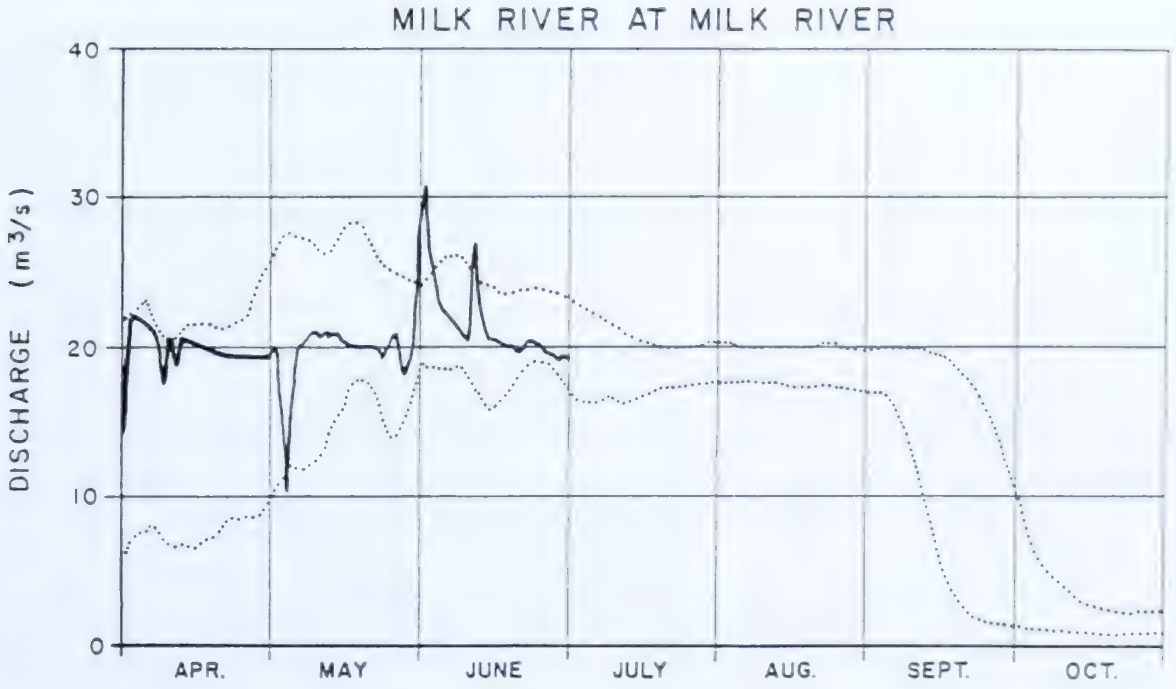
Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
SUBMITTED DATE	DESIGNED CHECKED	SUMMER PRECIPITATION MILK RIVER BASIN
APPROVED DATE	DRAWN L. Markley CHECKED	SCALE AS SHOWN DATE DEC., 1984

FIGURE 7



NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPH MILK RIVER
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN A. Parkes CHECKED	SCALE AS SHOWN DATE JAN. 1985

OLDMAN RIVER BASIN

Weather Conditions

June precipitation ranged from much below average in the plains and lower foothills areas of the Basin to below average in the mountain headwaters. Temperatures were slightly below average. Graphs of precipitation accumulation since May 1, 1985 for several key stations in the Basin are presented in Figure 9.

Streamflow Conditions

Natural streamflow volumes in June were below average for the major rivers in the southern half of the Basin (St. Mary, Belly and Waterton) and much below average for the northern headwaters. The natural flow of the Oldman River at Lethbridge was only about 50 percent of average.

River levels were moderately high in early June from snowmelt and some rainfall. The major rivers receded gradually throughout the month for lack of runoff from rainfall.

Irrigation water demand was high during June because of the lack of rainfall.

Hydrographs for a number of key river and irrigation diversion stations are presented in Figures 10 to 13 which follow.

Water Supply Volume Forecasts

The forecasts for the summer water supply have all been reduced as a result of the below average precipitation in June. In particular, the forecasts for the upper Oldman River and the Oldman River at Lethbridge have been reduced considerably.

As of July 1, the natural streamflow volume forecasts for the April to September period and for the remainder of the season are as follows:

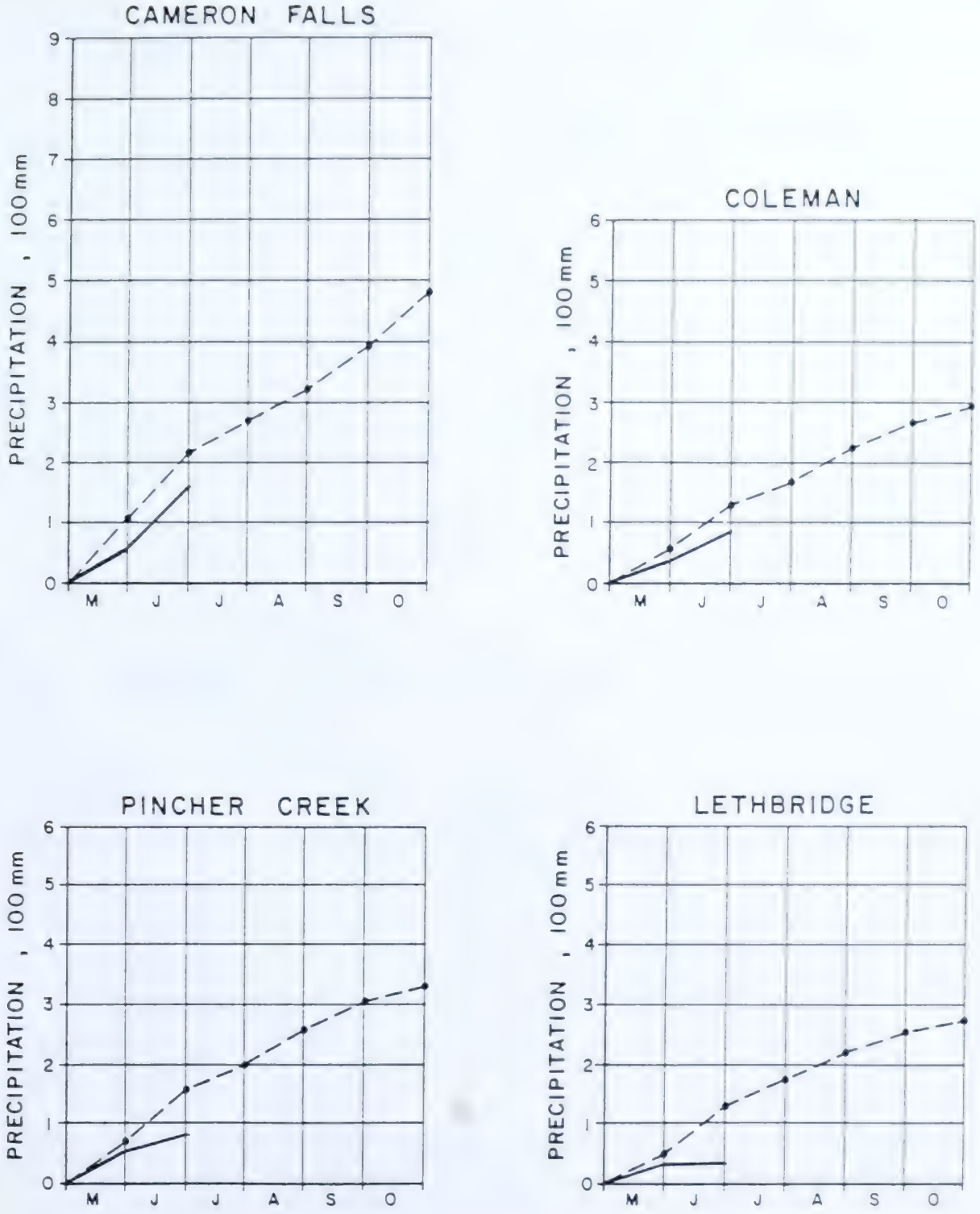
Station	Forecast April-Sept 1985 % of average	Forecast July-Sept 1985 % of average
St. Mary River/Int'l Bdy.	81	72
Belly River near Mountainview	78	64
Waterton River at Waterton Park	78	68
Oldman River at Fort Macleod	52	52
Oldman River at Lethbridge	58	55

The volume forecasts are based on snow survey and climatological data, and present natural flow trends. Rainfall in July and August usually has only a minor effect on summer water supply, therefore there is little hope for improvement in the situation.

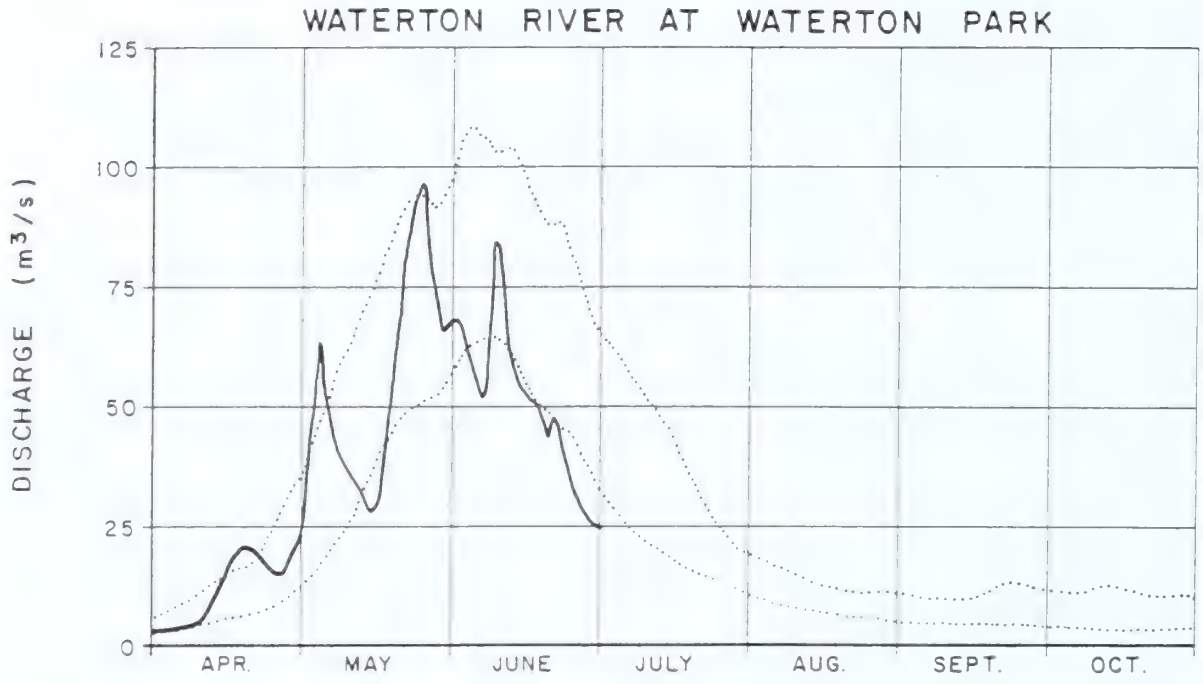
A more detailed presentation of the volume forecasts for 1985 is given in Table 1.

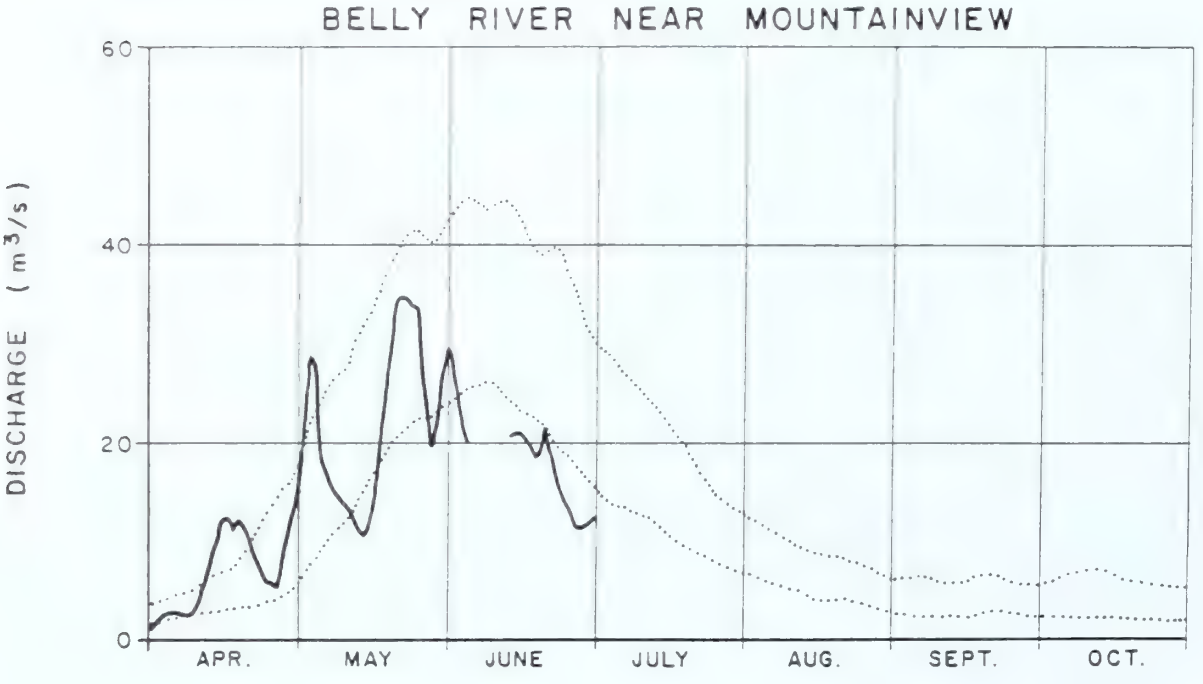
Water Storage Situation

Storage in most of the irrigation reservoirs was at normal levels as of July 1. The exception was Chin Reservoir which had fallen to below normal because of heavy irrigation water demand. Graphs of the storage conditions since April are presented in Figure 14. A detailed account of the present storage situation is presented in Table 2.



Alberta Environment — RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN	
		SUMMER PRECIPITATION OLDMAN RIVER BASIN	
SUBMITTED DATE	DESIGNED CHECKED		
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE DEC , 1984	FIGURE 9





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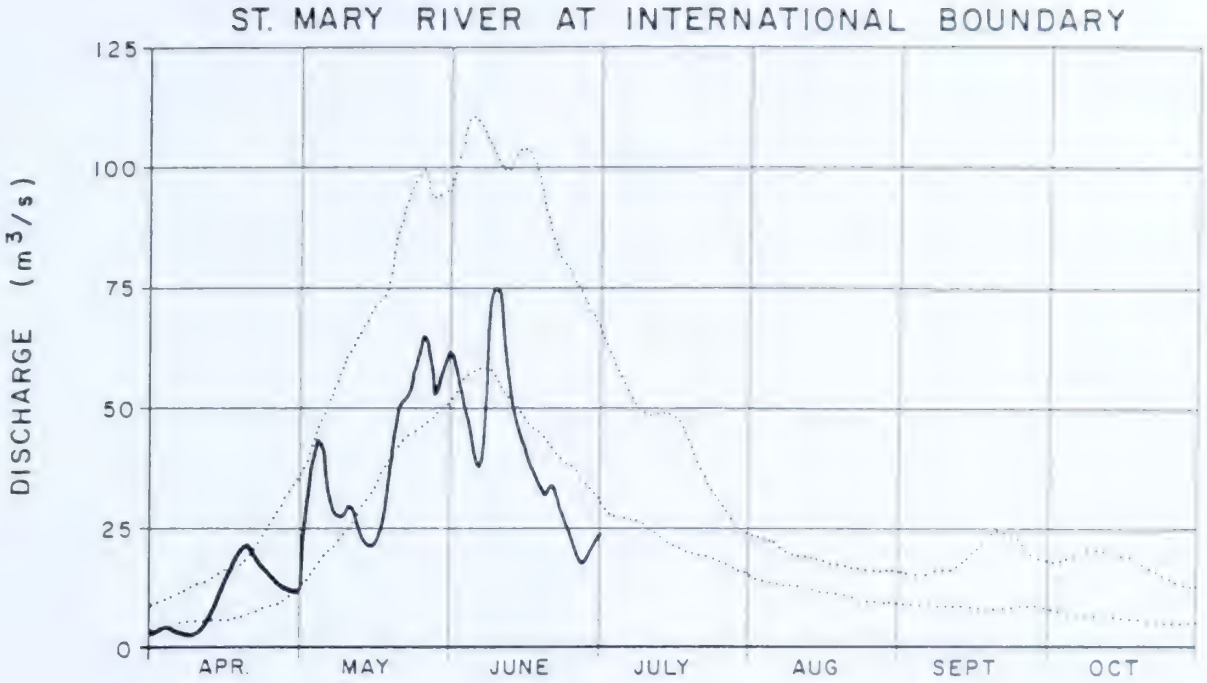
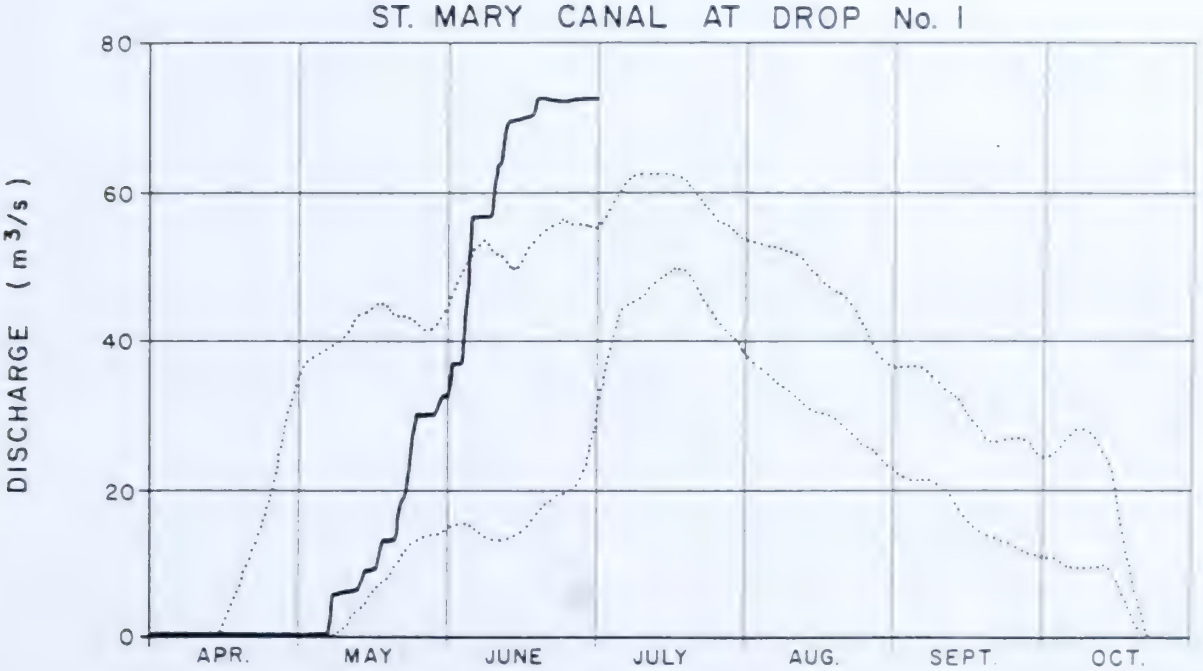
Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPHS OLDMAN RIVER BASIN
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE JAN., 1985

FIGURE 10





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Alberta ENVIRONMENT RIVER FORECAST CENTRE

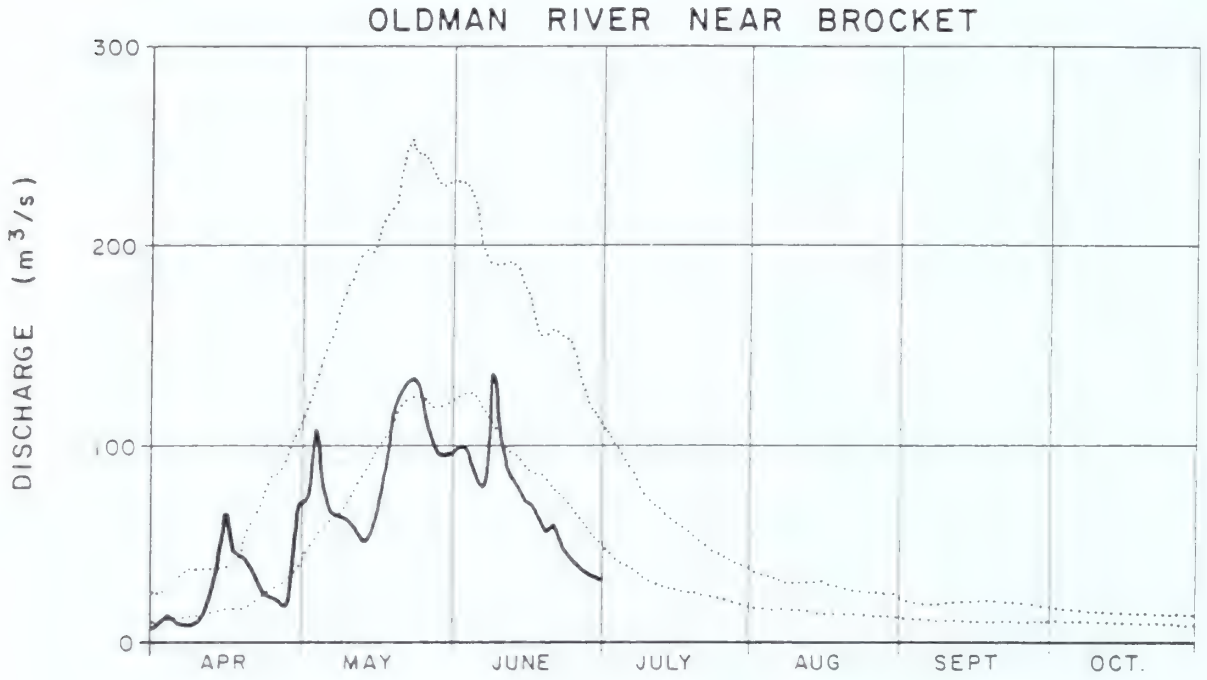
SUBMITTED DESIGNED
DATE CHECKED
APPROVED DRAWN B. Sanders
DATE

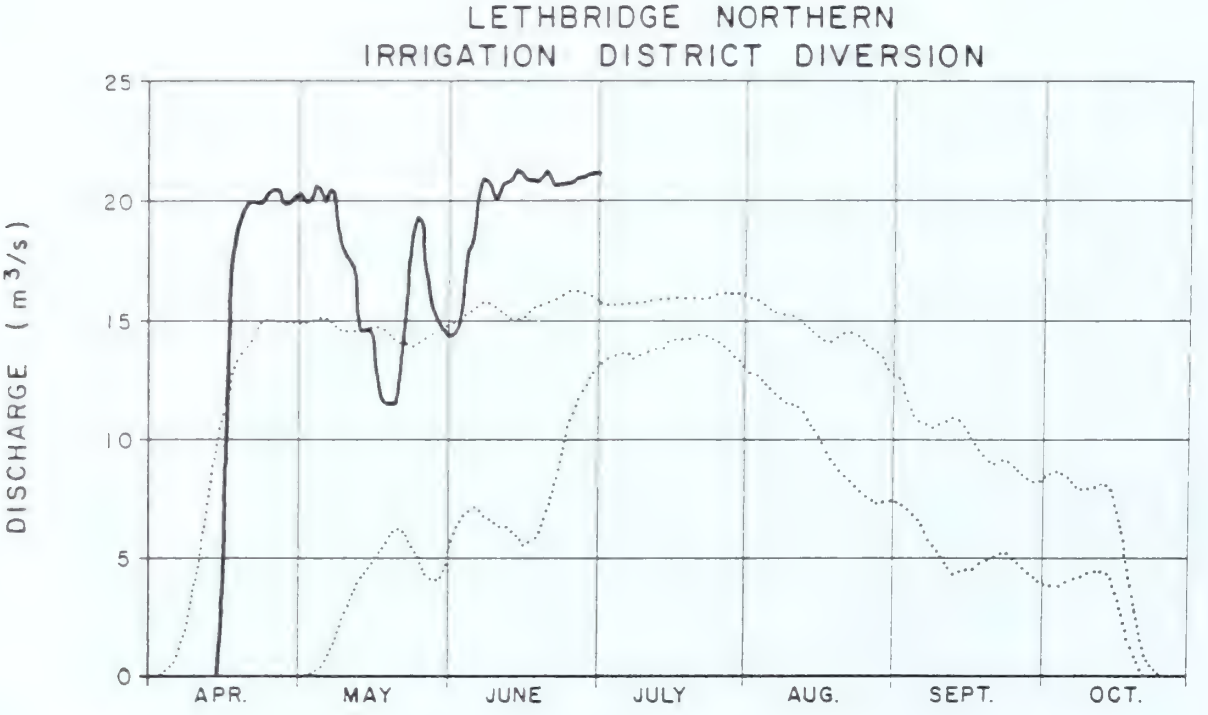
WATER SUPPLY BULLETIN

STREAMFLOW HYDROGRAPHS
OLDMAN RIVER BASIN

SCALE AS SHOWN
DATE JAN., 1985

FIGURE 11





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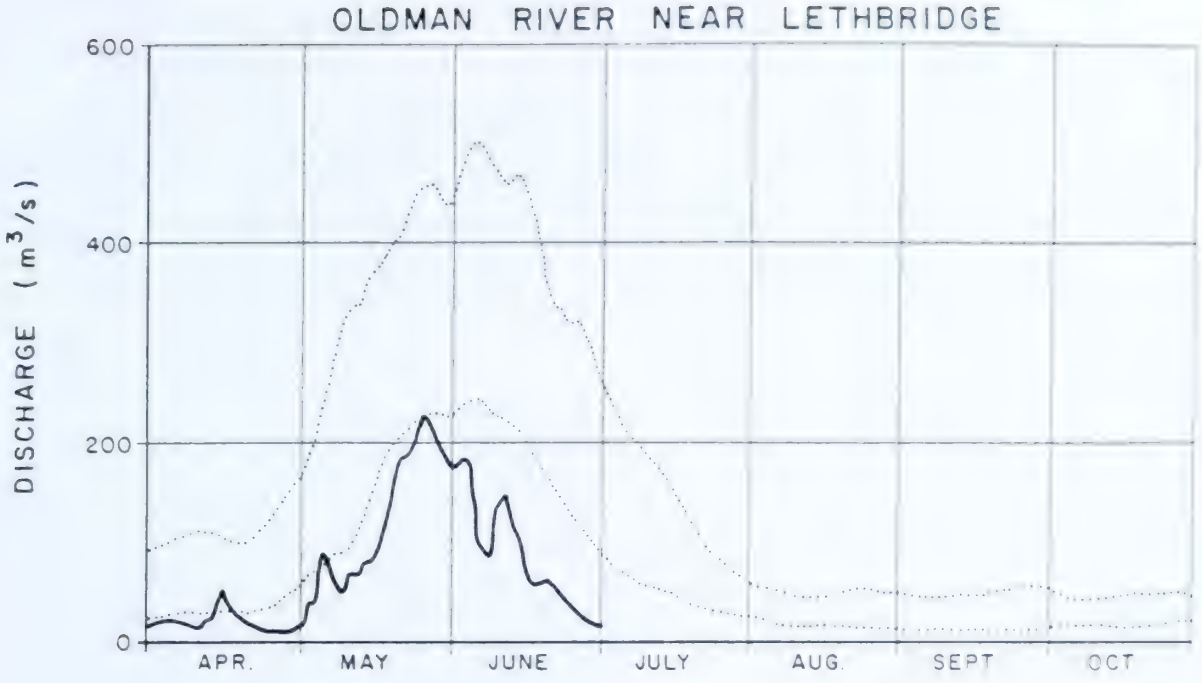
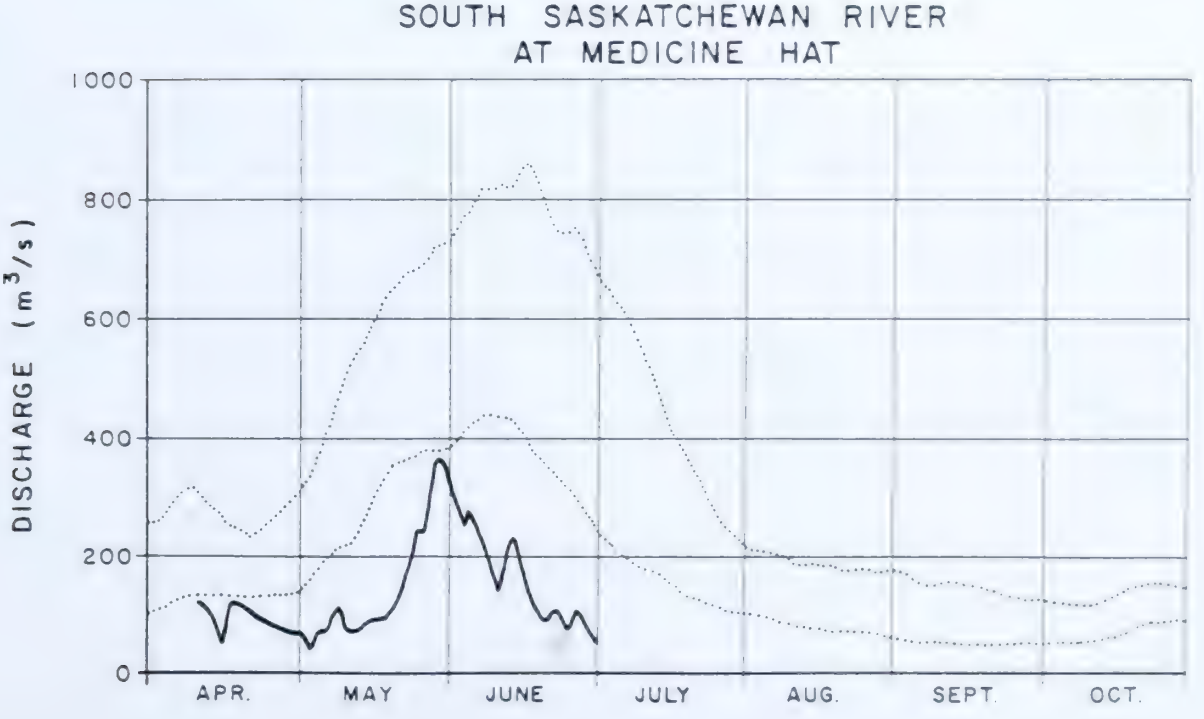
Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPHS OLDMAN RIVER BASIN
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B Sanders CHECKED	SCALE AS SHOWN DATE JAN., 1985

FIGURE 12





NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT
RIVER FORECAST CENTRE

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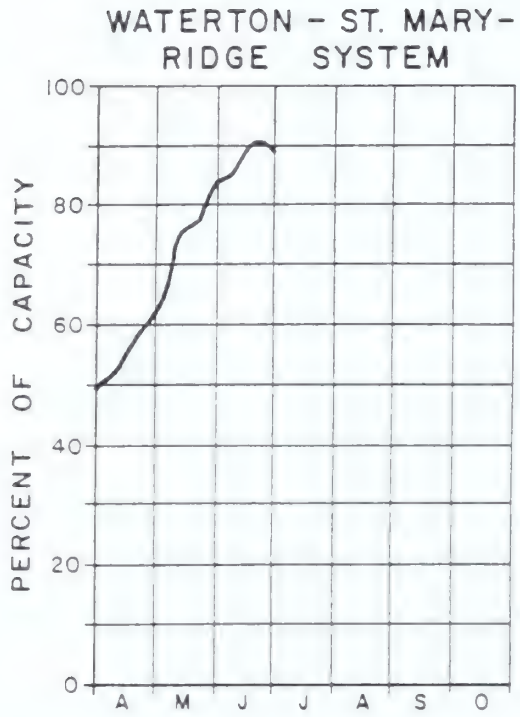
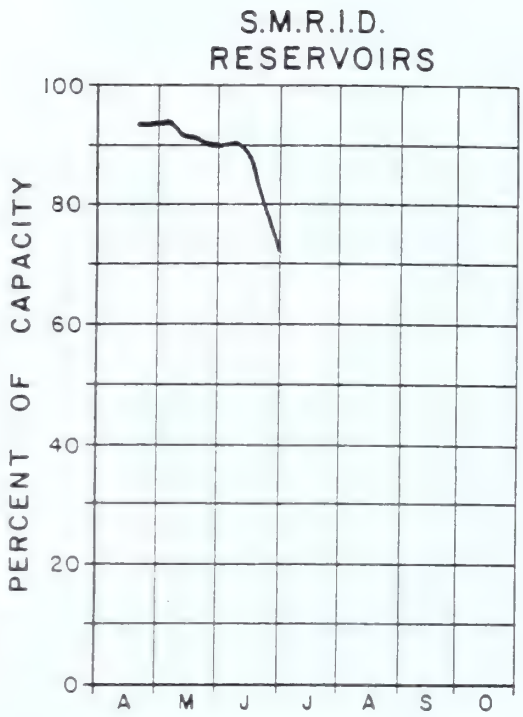
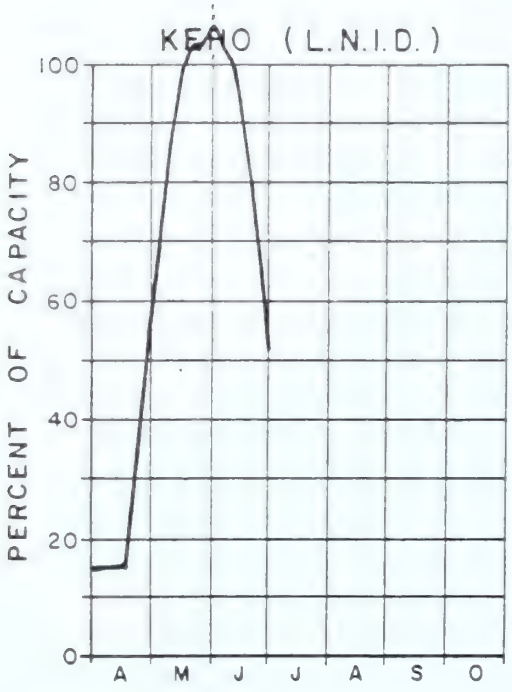
WATER SUPPLY BULLETIN
STREAMFLOW HYDROGRAPHS
OLDMAN RIVER BASIN

SCALE AS SHOWN
DATE JAN., 1985







Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN	
		RESERVOIR STORAGE OLDMAN RIVER BASIN	
SUBMITTED DATE	DESIGNED CHECKED		
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE DEC., 1984	FIGURE 14

BOW RIVER BASIN

Weather Conditions

Precipitation for the month of June ranged from much below average in the plains and lower foothills areas of the Basin to close to average in the headwaters around Lake Louise. Temperatures were slightly below average for the month. As of July 1, most of the seasonal snowpack had melted. Most of the snow which remained was located in the headwaters upstream of Banff. Graphs of precipitation accumulation since May 1, 1985 for a number of key climate stations are presented as Figure 15.

Streamflow Conditions

Natural streamflow volumes during June were generally below average for the Bow River and much below average for some of its major tributaries such as the Elbow and Highwood Rivers. Natural flow for the Bow River at Calgary was 77 percent of average in June, but the Highwood River natural flow was only 52 percent of average.

River levels were moderately high in early June from snowmelt. The foothills streams such as the Elbow and Highwood receded gradually throughout the month because of lack of rainfall. The Bow River levels fluctuated with temperatures as the mountain snowpack melted.

Irrigation diversion rates were high and steady throughout the month.

Hydrographs of several key river and irrigation diversion stations are presented in Figures 16 to 19 which follow.

Water Supply Volume Forecasts

The forecasts of natural streamflow volumes for the major rivers of the Basin for the May to September period have been lowered because of below average precipitation in June. In particular, the forecasts for the Elbow and Highwood Rivers have been revised downwards dramatically. As of July 1, the volume forecasts for the May to September period and for the remainder of the season are as follows:

Station	Forecast May-Sept 1985 % of average	Forecast July-Sept 1985 % of average
Bow River at Banff	83	87
Bow River at Calgary	77	83
Elbow River	59	73
Highwood River	52	74
Lake Minnewanka Inflow	62	70
Spray Lake Inflow	79	74
Barrier Lake Inflow (Kananaskis River)	72	72

The forecasts are based on snow survey and climatological data, and present natural flow trends. Precipitation in July and August usually has only a minor effect on summer water supply therefore there is little hope for improvement to the present situation.

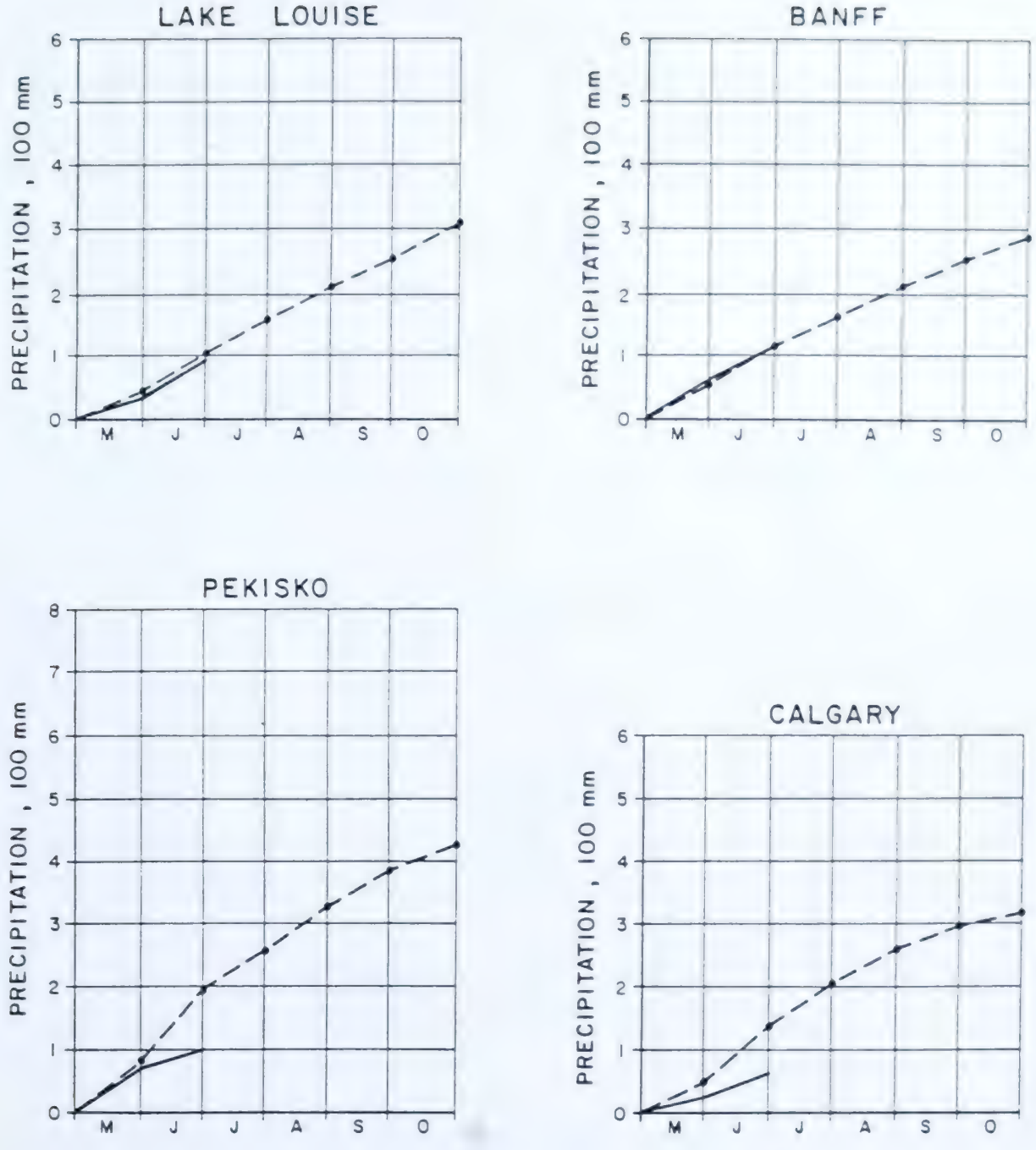
A more detailed presentation of the volume forecasts is given in Table 1.

Water Storage Situation

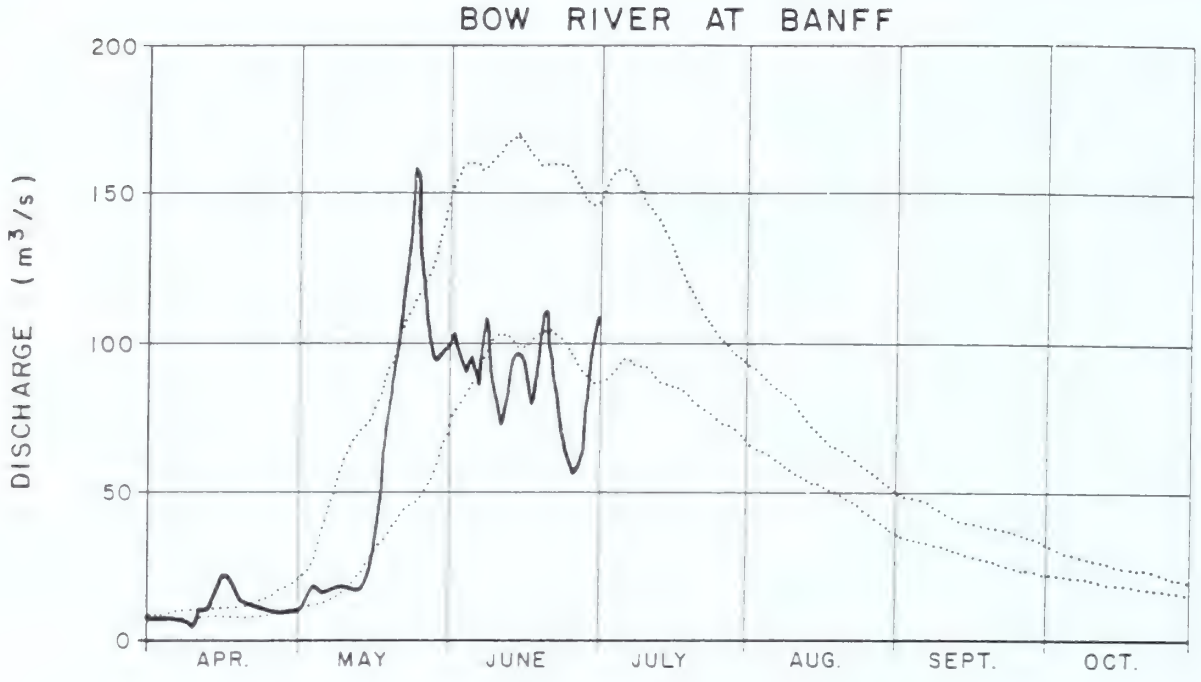
The major storage facilities for the irrigation districts were at normal levels as of July 1 but levels were falling steadily.

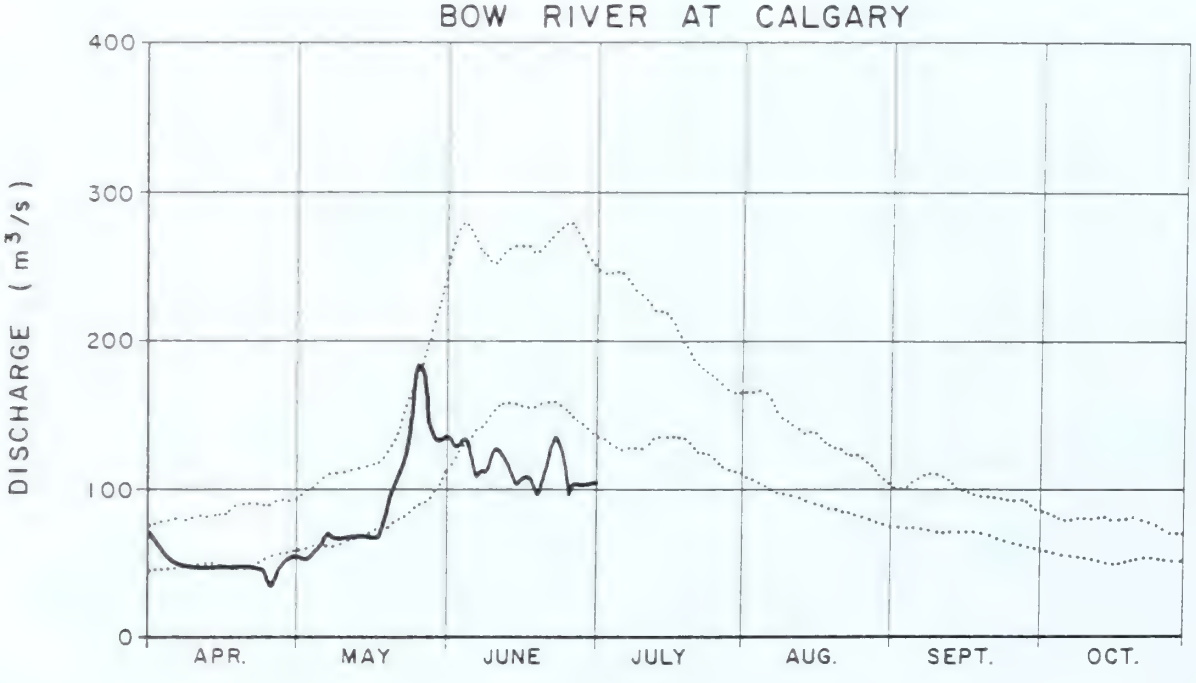
Storage levels in the hydroelectric power reservoirs in the headwaters were normal for Spray Lake and the Upper Kananaskis Lake as of July 1, but below average for Lake Minnewanka and the Lower Kananaskis Lake.

Graphs of the storage conditions during since April are presented in Figure 20. A detailed account of the storage situation as of July 1 is presented in Table 2.



Alberta ENVIRONMENT — RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
SUBMITTED DATE	DESIGNED CHECKED	SUMMER PRECIPITATION BOW RIVER BASIN
APPROVED DATE	DRAWN B Sanders TRACED	SCALE AS SHOWN DATE DEC , 1984
		FIGURE 15



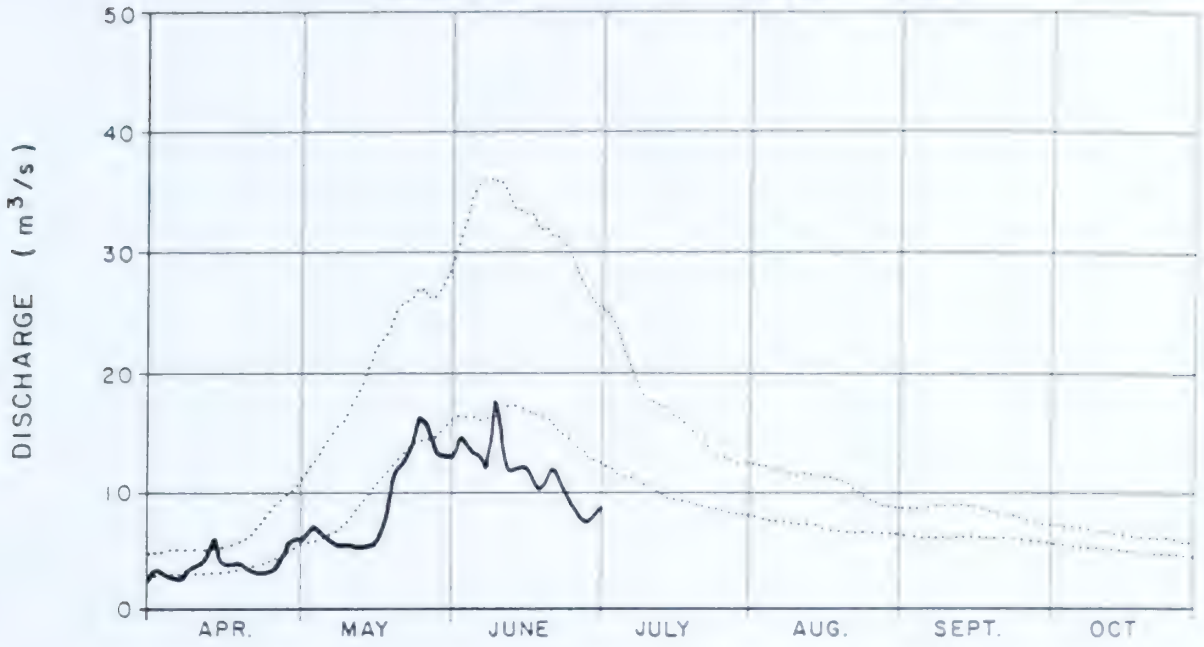


NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

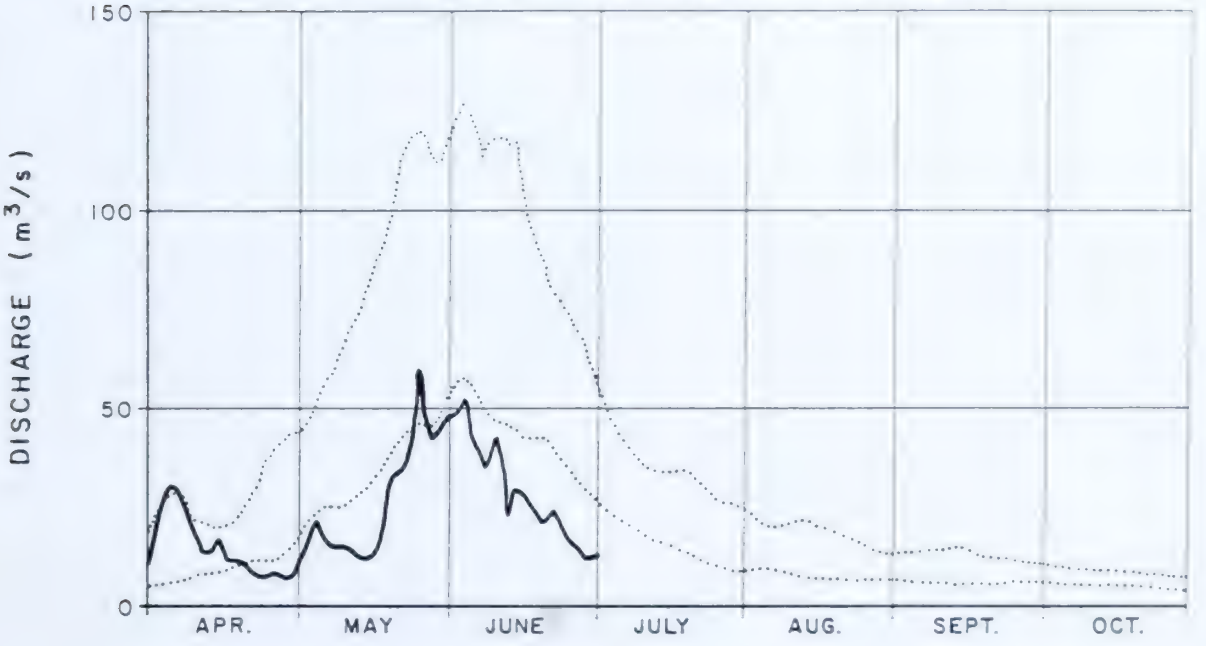
Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPHS BOW RIVER BASIN
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE JAN., 1985

FIGURE 16

ELBOW RIVER AT BRAGG CREEK

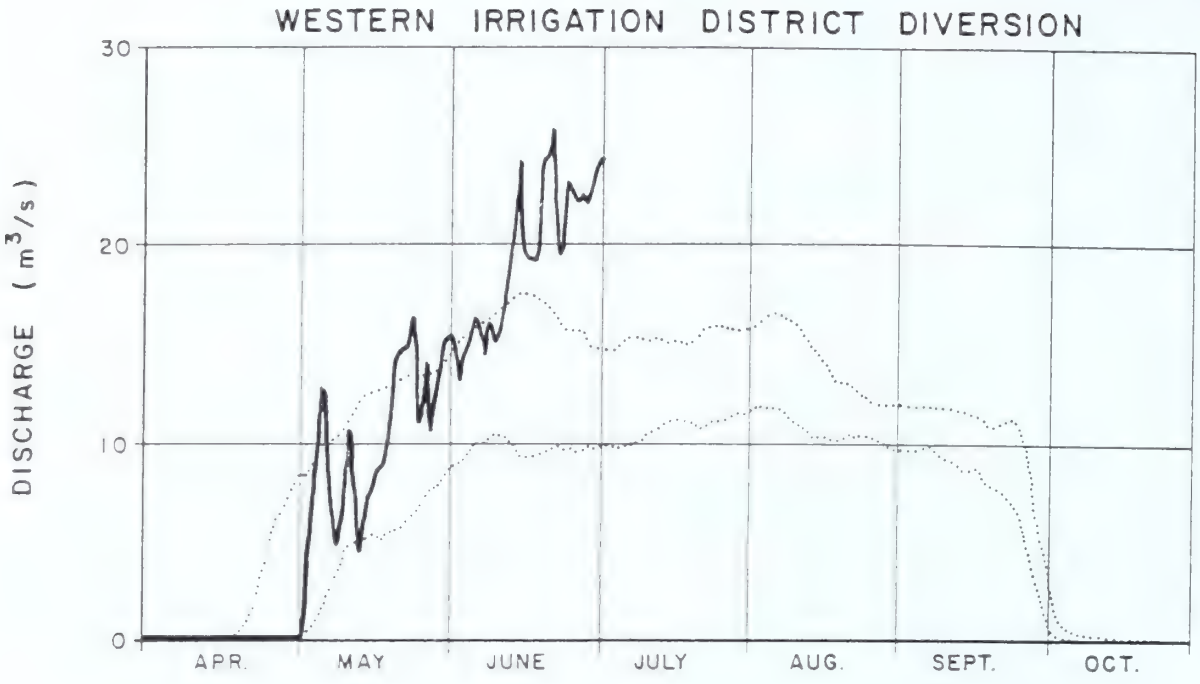


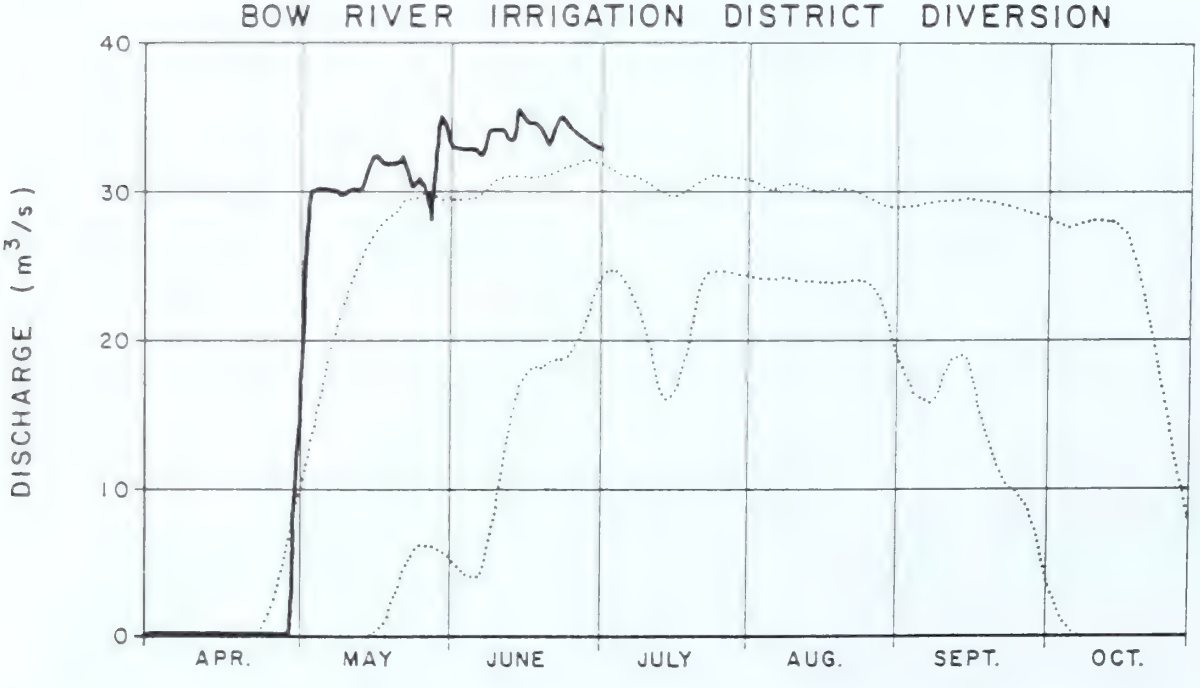
HIGHWOOD RIVER NEAR THE MOUTH



NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
SUBMITTED DATE	DESIGNED CHECKED	STREAMFLOW HYDROGRAPHS BOW RIVER BASIN
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN FIGURE 17 Page 25
		DATE JAN . 985

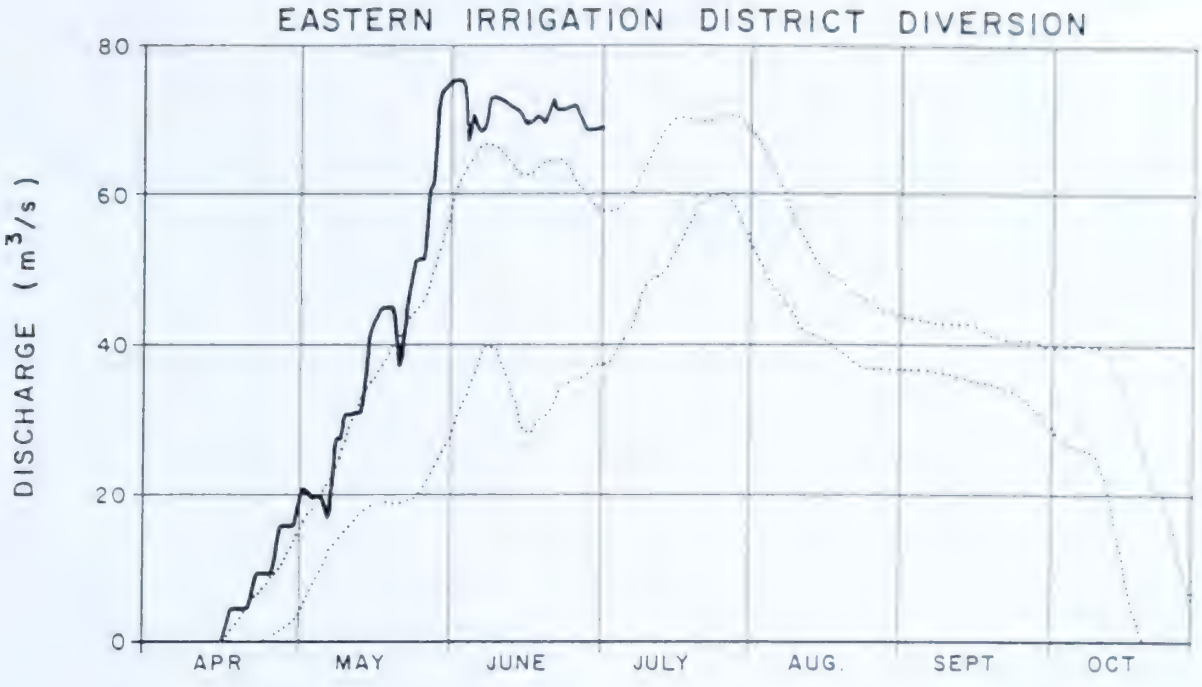


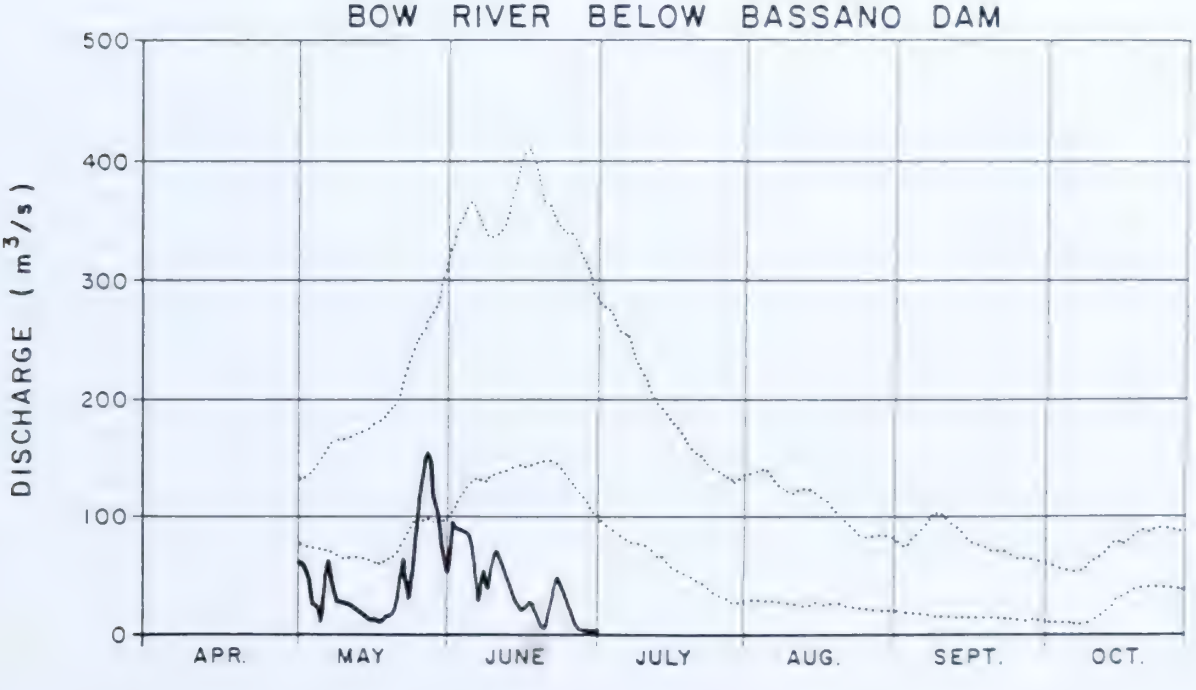


NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPHS BOW RIVER BASIN
SUBMITTED DATE	DESIGNED	
APPROVED DATE	CHECKED	
	DRAWN B. Sanders	SCALE AS SHOWN
		DATE JAN., 1985

FIGURE 18 Page 26



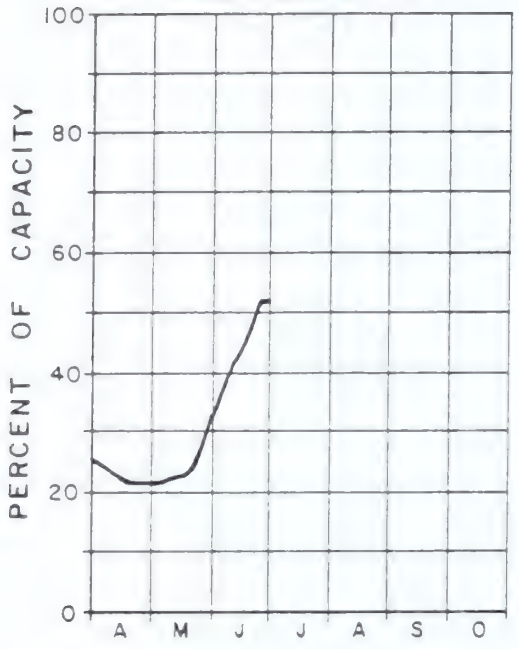


NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of normal range of behaviour.

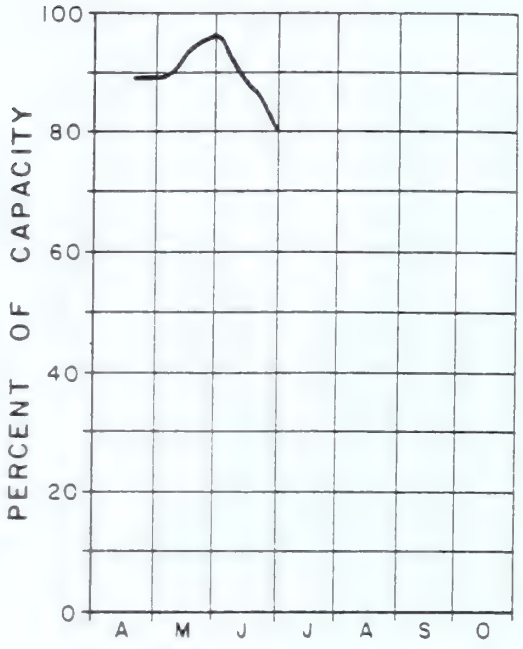
Alberta ENVIRONMENT — RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
SUBMITTED DATE	DESIGNED	STREAMFLOW HYDROGRAPHS BOW RIVER BASIN
APPROVED DATE	DRAWN B. Sanders	SCALE AS SHOWN DATE JAN , 1985

FIGURE 19 Page 27

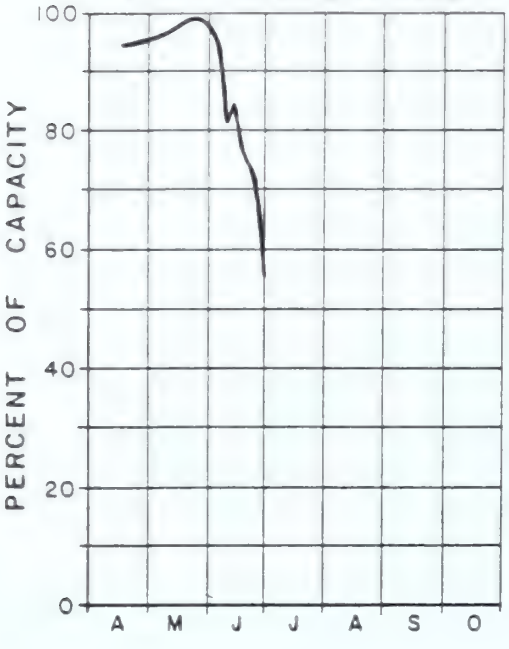
TRANSALTA
BOW RIVER
RESERVOIRS



McGREGOR - TRAVERS
SYSTEM



E.I.D. RESERVOIRS



Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		RESERVOIR STORAGE BOW RIVER BASIN
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN DATE DEC., 1984

FIGURE 20

RED DEER RIVER BASIN

Weather Conditions

June precipitation was generally much below average in the Basin. Temperatures were slightly below average. Very little of the mountain snowpack remained at the end of the month. Graphs of precipitation accumulation for the climate stations at Sundre and Red Deer since the beginning of May are presented in Figure 21.

Streamflow Conditions

Natural flow was much below average during June because of the lack of rainfall. Inflow to Gleniffer Lake was only 36 percent of average. The level of the Red Deer River downstream of the Dickson Dam remained low throughout the month as Lake Gleniffer was filled.

Hydrographs for two key river stations in the Basin are presented in Figure 22.

Water Supply Volume Forecasts

The forecasts of natural streamflow volume for the Red Deer River have been lower drastically from the June 1 predictions because of much below average precipitation in June. The volume forecasts for the entire season as well as the remainder of the season are now as follows:

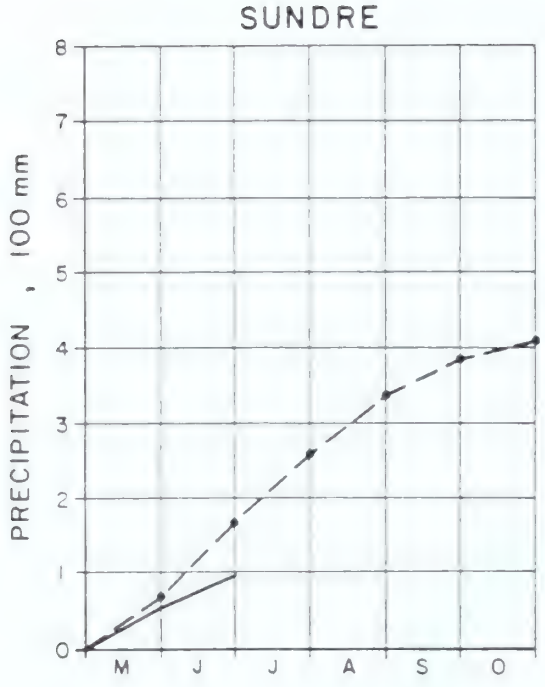
Station	Forecast May-Sept 1985 % of average	Forecast July-Sept 1985 % of average
Gleniffer Lake Inflow (Dickson Dam)	55	60
Red Deer River at Red Deer	50	60

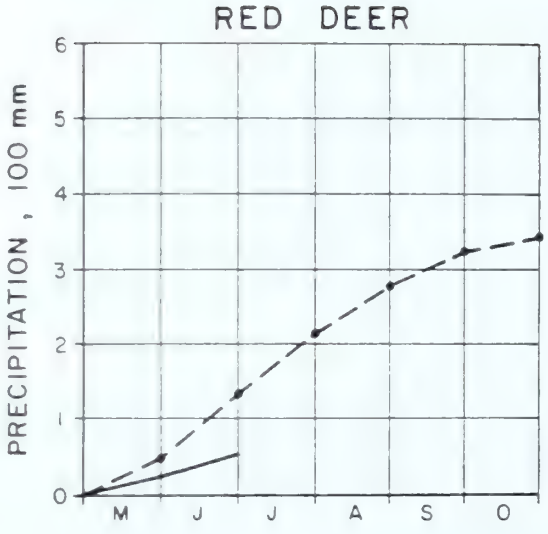
The forecasts above are based on snow survey and climatological data, and present natural flow trends. Rainfall during July usually has a significant effect on water supply conditions.

A more detailed presentation of the water supply volume forecasts is given in Table 1.

Water Storage Situation

The storage level in Gleniffer Lake as of July 1 was normal for the time of year. A graph of the storage condition of the lake since April 1 is presented as Figure 23. A detailed account of the situation is provided in Table 2.



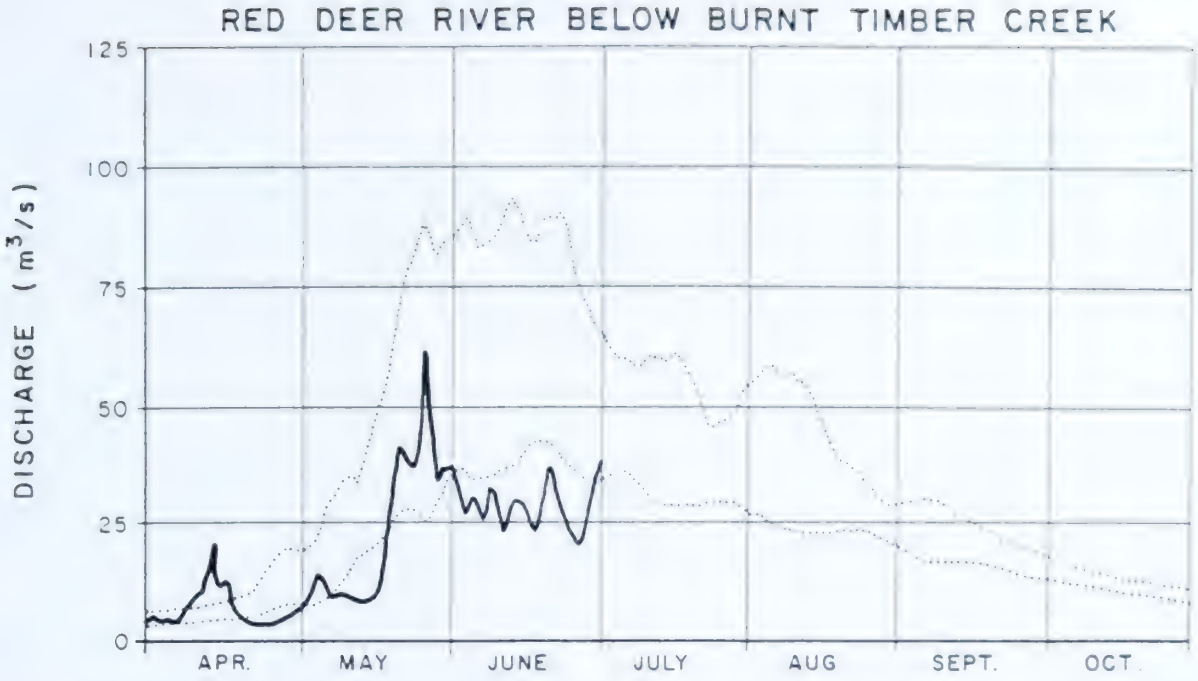


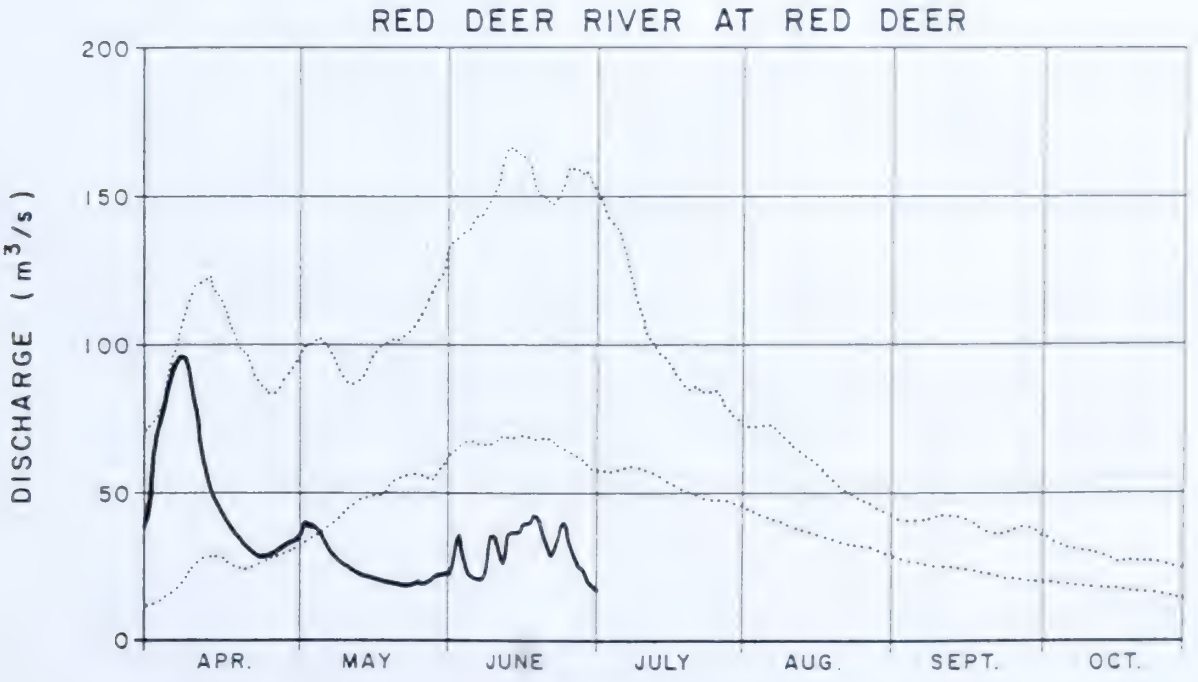
LEGEND

— — — AVERAGE

——— 1985

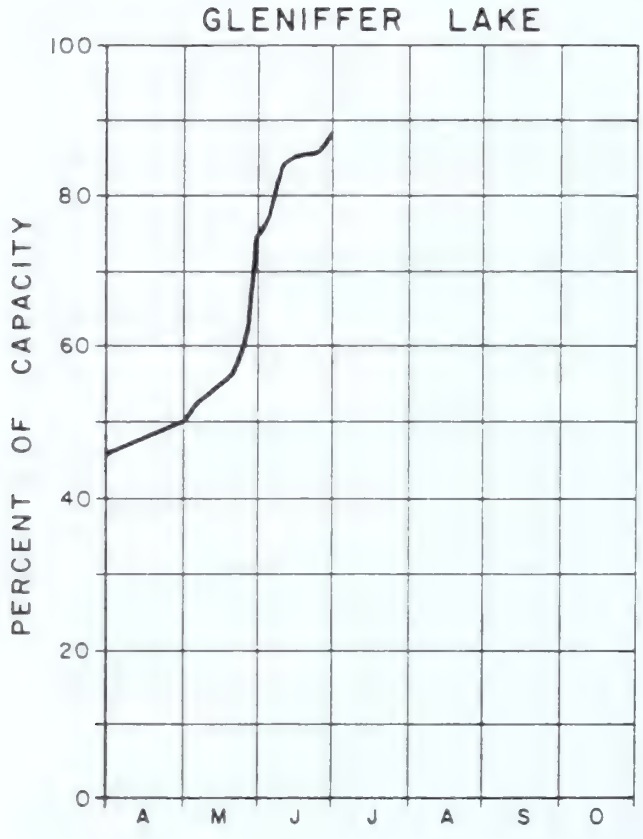
Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN	
SUBMITTED	DESIGNED	SUMMER PRECIPITATION	
DATE	CHECKED	RED DEER RIVER BASIN	
APPROVED	DRAWN S. Sanders	SCALE AS SHOWN	FIGURE 21 Page 30
DATE	CHECKED	DATE DEC., 1984	





NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of normal range of behaviour.

Alberta ENVIRONMENT — RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
SUBMITTED DATE	DESIGNED	STREAMFLOW HYDROGRAPHS RED DEER RIVER BASIN
APPROVED DATE	DRAWN B. Sanders	SCALE AS SHOWN — FIGURE 22 Page 31
		DATE JAN., 1985



Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN	
		RESERVOIR STORAGE RED DEER RIVER BASIN	
SUBMITTED DATE	DESIGNED CHECKED		
APPROVED DATE	DRAWN B Sanders CHECKED	SCALE AS SHOWN DATE DEC., 1984	FIGURE 23

NORTH SASKATCHEWAN RIVER BASIN

Weather Conditions

June precipitation was below average in the headwaters of the Basin but close to average in the plains areas. Temperatures were slightly below average. A heavy rainfall on June 23 created some minor flooding in the Edmonton area. This storm also dumped a large snowfall in the Brazeau River watershed. Most of the seasonal snowpack had been depleted by the end of June. Graphs of precipitation accumulation for Rocky Mountain House and Edmonton since the beginning of May are presented as Figure 24.

Streamflow Conditions

Natural flow during June was generally below average because of below average rainfall in the Basin headwaters. The natural flow at Edmonton was only about 75 percent of average for the month.

Hydrographs for the North Saskatchewan River at Rocky Mountain House and at Edmonton are presented in Figure 25.

Water Supply Volume Forecasts

The forecast of natural streamflow volume have been reduced slightly for the upper North Saskatchewan and dramatically for the Brazeau River this month because of below average precipitation in June. The volume forecasts for the April to September period as well as the remainder of the season are now as follows:

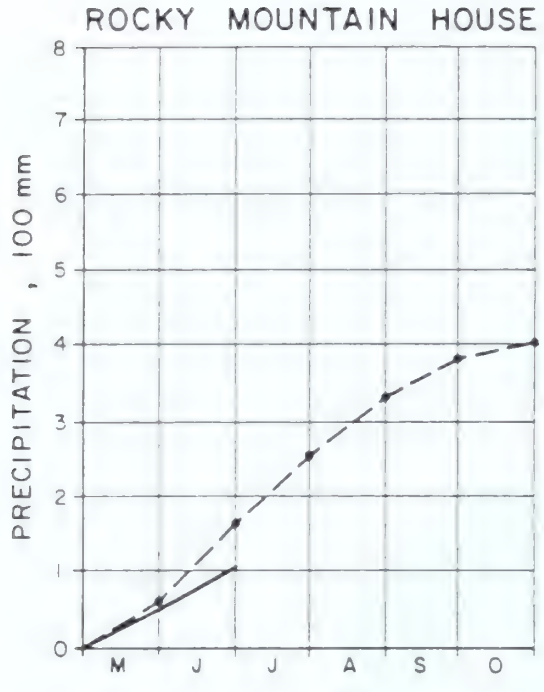
Station	Forecast Apr-Sept 1985 % of average	Forecast July-Sept 1985 % of average
North Saskatchewan River at Bighorn Dam	89	90
Brazeau River at Brazeau Dam	71	82
North Saskatchewan River at Edmonton	75	80

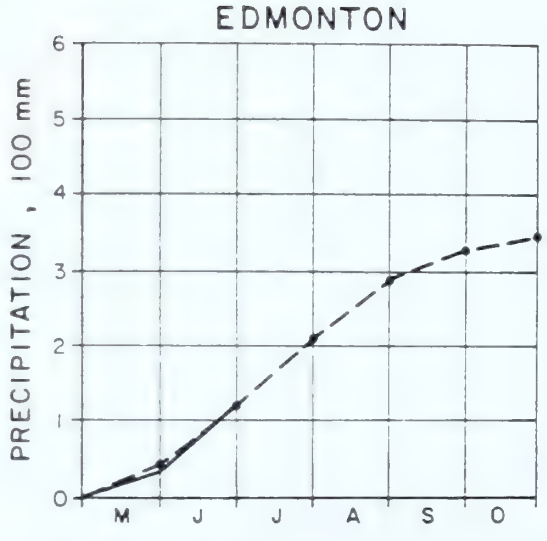
The forecasts above are based on snow survey and climatological data, and present natural flow trends. Rainfall in July usually has a significant effect on water supply conditions.

A more detailed account of the volume forecasts is presented in Table 1.

Water Storage Situation

The storage levels in the hydroelectric power reservoirs in the Basin headwaters were still very low, but normal and filling rapidly as of July 1. A graph of the total storage in Lake Abraham and the Brazeau Reservoir since April is presented as Figure 26. A detailed account of the storage situation is given in Table 2.





LEGEND

——— AVERAGE

——— 1985

Alberta ENVIRONMENT

RIVER FORECAST CENTRE

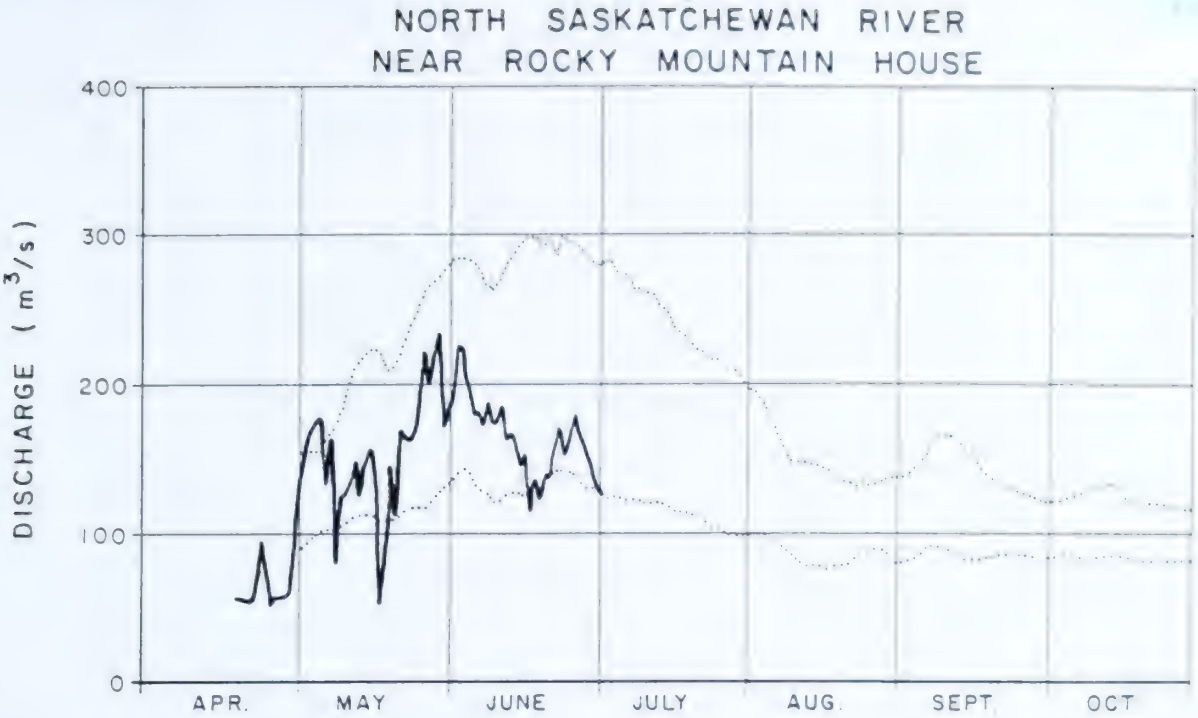
B. Sanders

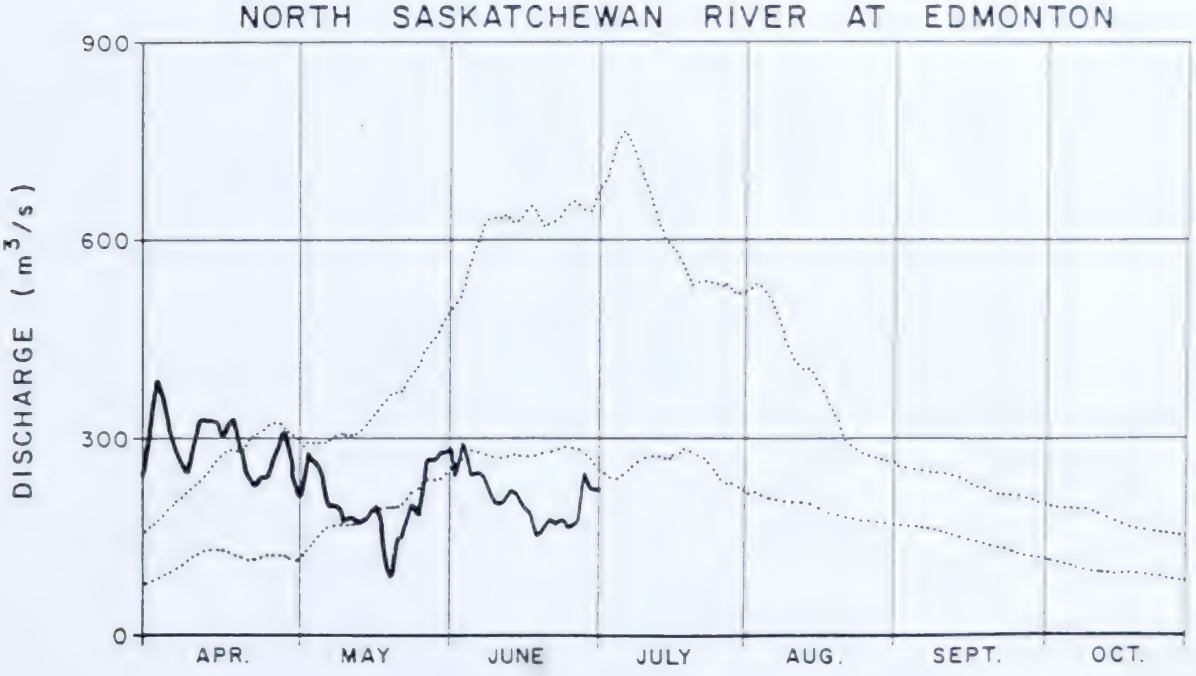
WATER SUPPLY BULLETIN

SUMMER PRECIPITATION
NORTH SASKATCHEWAN

SCALE AS SHOWN
DATE DEC., 1984

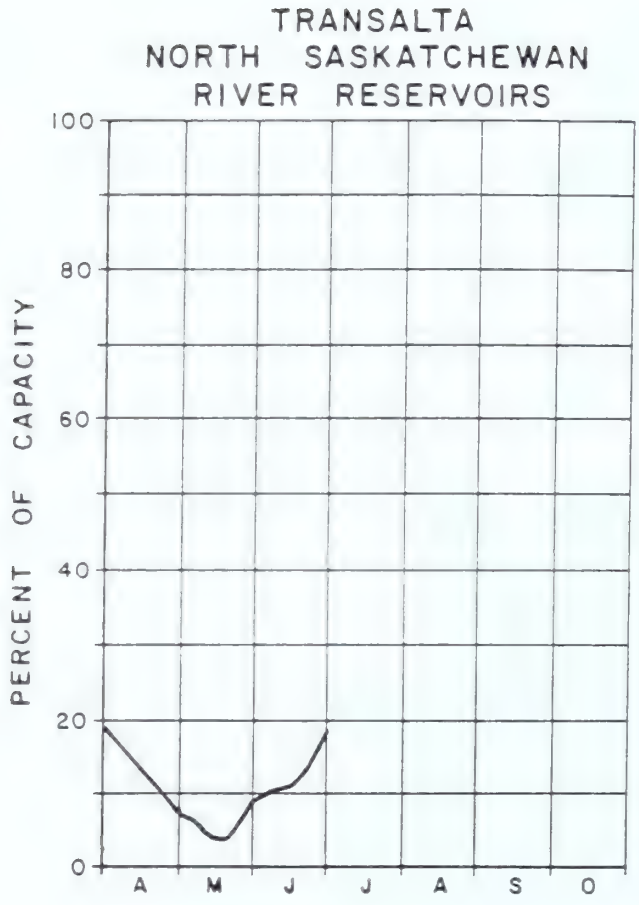
FIGURE 24 Page 34





NOTE: Solid line indicates flow for current year; dotted lines show upper and lower quartile values for period of record as an indication of the range of normal behaviour.

Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN
		STREAMFLOW HYDROGRAPHS NORTH SASKATCHEWAN RIVER BASIN
SUBMITTED DATE	DESIGNED CHECKED	
APPROVED DATE	DRAWN B. Sanders CHECKED	SCALE AS SHOWN FIGURE 25 Page 35
		DATE JAN., 1985



Alberta ENVIRONMENT RIVER FORECAST CENTRE		WATER SUPPLY BULLETIN	
SUBMITTED DATE	DESIGNED CHECKED	RESERVOIR STORAGE NORTH SASKATCHEWAN RIVER BASIN	
APPROVED DATE	DRAWN B Sanders CHECKED	SCALE AS SHOWN DATE DEC., 1984	FIGURE 26 Page 36

APPENDIX A

ALBERTA ENVIRONMENT

REAL-TIME CLIMATE STATIONS

ALBERTA ENVIRONMENT REAL-TIME CLIMATE STATIONS

OLDMAN RIVER BASIN

MONTHLY PRECIPITATION 1984 - 85

Precipitation in millimetres

STATION	MAP CODE	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Akamina	1	126	133	20	98	84	136	66	117				
Beauvais	10	15	29	7	22	32	40	54	19				
Chief Customs	4	40	88	11	48	56	72	68	49				
Gardiner Creek	9	190	200	21	93	91	136	53	74				
Goat Haunt	2	174	139	8	76	69	122	48	N/A				
Lee Creek	5	1	34	10	31	34	41	66	36				
Pasque	13	26	45	6	16	32	102	40	53				
Racehorse Creek	12	88	84	10	45	53	139	67	86				
Red Rock	9	78	76	5	51	36	68	52	61				
St. Mary Ranger Stn.	3	59	63	28	45	33	45	52	75				
Spionkop	7	157	175	17	115	98	168	76	86				
Vicary Creek	11	20	34	9	21	24	55	41	50				
West Castle	8	146	122	17	83	49	152	47	87				

NOTES: 1. The map code refers to the station location number on the key map which follows.

2. Average monthly precipitation values have not yet been established for these stations.

ALBERTA ENVIRONMENT REAL-TIME CLIMATE STATIONS

BOW RIVER BASIN

MONTHLY PRECIPITATION 1984 - 85

Precipitation in millimetres

STATION	MAP CODE	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Compression Ridge	20	13	23	7	25	34	81	72	41				
Cox Hill	21	5	28	7	23	26	102	76	44				
Cuthead Lake	27	52	54	5	41	20	76	58	94				
Elbow Ranger Station	22	4	18	10	16	25	72	52	44				
Evans-Thomas Creek	19	32	43	7	29	35	104	62	61				
Forget-me-not	16	11	23	11	25	35	100	85	24				
Ghost Diversion	25	5	18	0	28	29	77	52	42				
Ghost Ranger Station	26	5	12	6	18	22	48	41	46				
Jumpingpound Ranger Stn.	23	6	18	7	21	5	61	N/A	N/A				
Little Elbow Summit	17	58	68	7	44	36	119	61	77				
Sheep II	15	8	21	8	21	31	74	72	33				
Sullivan	14	4	19	8	18	32	50	50	N/A				
Sunshine Village	24	74	97	7	48	35	107	66	N/A				
Three Isle Lake	18	113	132	7	58	43	151	78	125				

NOTES: 1. The map code refers to the station location number on the key map which follows.

2. Average monthly precipitation values have not yet been established for these stations.

ALBERTA ENVIRONMENT REAL-TIME CLIMATE STATIONS

RED DEER RIVER BASIN

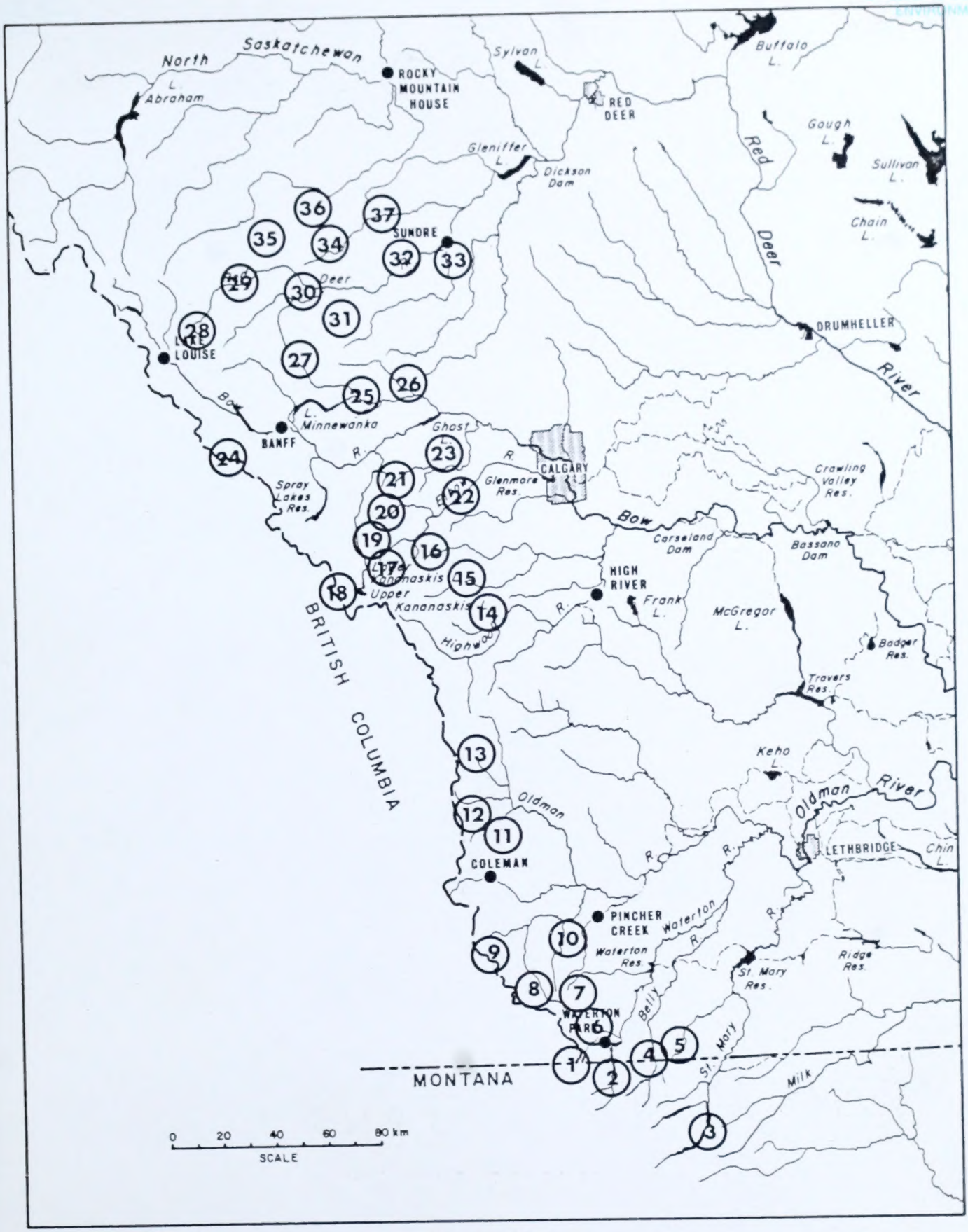
MONTHLY PRECIPITATION 1984 - 85

Precipitation in millimetres

STATION	MAP CODE	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Coal Camp	32	2	10	6	26	15	64	58	39				
Dogrib	30	9	15	3	20	16	76	61	66				
Fallentimber	31	3	10	5	18	23	63	60	52				
James River Headwaters	34	3	10	5	23	15	81	77	49				
James River Ranger Stn.	37	10	9	9	23	16	44	53	41				
Limestone	36	5	10	10	28	20	86	50	70				
Scalp Creek	35	7	17	8	26	19	67	36	86				
Scotch Camp	29	15	21	0	13	5	31	36	38				
Skoki	28	50	76	6	43	20	78	55	79				
Sundre Ranger Station	33	8	10	3	22	3	46	55	45				

NOTES: 1. The map code refers to the station location number on the key map which follows.

2. Average monthly precipitation values have not yet been established for these stations.



KEY MAP FOR
ALBERTA ENVIRONMENT
REAL-TIME CLIMATE STATIONS